

=> d his ful

(FILE 'HOME' ENTERED AT 12:46:55 ON 16 SEP 2009)

FILE 'HCAPLUS' ENTERED AT 12:47:18 ON 16 SEP 2009

L1 1 SEA SPE=ON ABB=ON PLU=ON US20060246356/PN  
D L1 ALL  
SAV L1 WEI902/A

FILE 'REGISTRY' ENTERED AT 12:48:36 ON 16 SEP 2009

L2 1 SEA SPE=ON ABB=ON PLU=ON 12057-17-9  
L3 1 SEA SPE=ON ABB=ON PLU=ON 12190-79-3  
E LITHIUM NICKEL OXIDE/CN  
L4 1 SEA SPE=ON ABB=ON PLU=ON "LITHIUM NICKEL OXIDE"/CN  
L5 4518 SEA SPE=ON ABB=ON PLU=ON LI (L) CO (L) NI/ELS  
L6 4384 SEA SPE=ON ABB=ON PLU=ON L5 (L) O/ELS  
L7 456 SEA SPE=ON ABB=ON PLU=ON L6 (L) 4/ELC.SUB  
L8 4 SEA SPE=ON ABB=ON PLU=ON 553-90-2 OR 615-52-1 OR  
2050-60-4 OR 20602-87-3  
L9 2 SEA SPE=ON ABB=ON PLU=ON 1120-71-4 OR 872-36-6

FILE 'ZCAPLUS' ENTERED AT 13:07:05 ON 16 SEP 2009

L10 QUE SPE=ON ABB=ON PLU=ON LIC002 OR LINI02 OR LIMN204  
L11 QUE SPE=ON ABB=ON PLU=ON LITHIUM# (2W) (COBALT# OR  
MANGANESE# OR NICKEL#) (2W) (OXIDE#)  
L12 QUE SPE=ON ABB=ON PLU=ON (DIALKYL# OR DIBUTYL# OR  
DIETHYL# OR METHYL#(W)ETHYL#) (2W) (OXALATE#)  
SET LINE 250  
SET DETAIL OFF  
E 1,3-PROPANE SULTONE+ALL/CT  
SET LINE LOGIN  
SET DETAIL LOGIN  
L13 QUE SPE=ON ABB=ON PLU=ON " 1,3-PROPANE SULTONE" OR  
"1,3-PROPANESULTONE" OR VINYLENECARBONATE# OR VINYLENE#(W  
)CARBONATE#

FILE 'JAPIO, PASCAL, ENERGY, INSPEC, COMPENDEX, WPIX, HCAPLUS'  
ENTERED AT 13:13:25 ON 16 SEP 2009

L14 1283 SEA SPE=ON ABB=ON PLU=ON L2 OR L3 OR L4 OR L7 OR L10  
OR L11  
L15 1309 SEA SPE=ON ABB=ON PLU=ON L2 OR L3 OR L4 OR L7 OR L10  
OR L11  
L16 1659 SEA SPE=ON ABB=ON PLU=ON L2 OR L3 OR L4 OR L7 OR L10

		OR L11						
L17	3537	SEA SPE=ON	ABB=ON	PLU=ON	L2 OR L3 OR L4 OR L7 OR L10			
		OR L11						
L18	3339	SEA SPE=ON	ABB=ON	PLU=ON	L2 OR L3 OR L4 OR L7 OR L10			
		OR L11						
L19	3688	SEA SPE=ON	ABB=ON	PLU=ON	L2 OR L3 OR L4 OR L7 OR L10			
		OR L11						
L20	19771	SEA SPE=ON	ABB=ON	PLU=ON	L2 OR L3 OR L4 OR L7 OR L10			
		OR L11						
	TOTAL FOR ALL FILES							
L21	34586	SEA SPE=ON	ABB=ON	PLU=ON	L2 OR L3 OR L4 OR L7 OR L10			
		OR L11						
L22	56	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
L23	80	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
L24	23	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
L25	12	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
L26	74	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
L27	495	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
L28	4093	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
	TOTAL FOR ALL FILES							
L29	4833	SEA SPE=ON	ABB=ON	PLU=ON	L8 OR L12			
L30	258	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
L31	141	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
L32	40	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
L33	95	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
L34	193	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
L35	977	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
L36	4071	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
	TOTAL FOR ALL FILES							
L37	5775	SEA SPE=ON	ABB=ON	PLU=ON	L9 OR L13			
L38	0	SEA SPE=ON	ABB=ON	PLU=ON	L14 AND L22 AND L30			
L39	0	SEA SPE=ON	ABB=ON	PLU=ON	L15 AND L23 AND L31			
L40	0	SEA SPE=ON	ABB=ON	PLU=ON	L16 AND L24 AND L32			
L41	0	SEA SPE=ON	ABB=ON	PLU=ON	L17 AND L25 AND L33			
L42	0	SEA SPE=ON	ABB=ON	PLU=ON	L18 AND L26 AND L34			
L43	0	SEA SPE=ON	ABB=ON	PLU=ON	L19 AND L27 AND L35			
L44	1	SEA SPE=ON	ABB=ON	PLU=ON	L20 AND L28 AND L36			
	TOTAL FOR ALL FILES							
L45	1	SEA SPE=ON	ABB=ON	PLU=ON	L21 AND L29 AND L37			
		D L45 KWIC						
L46	0	SEA SPE=ON	ABB=ON	PLU=ON	L22 AND L14			
L47	0	SEA SPE=ON	ABB=ON	PLU=ON	L23 AND L15			
L48	0	SEA SPE=ON	ABB=ON	PLU=ON	L24 AND L16			
L49	0	SEA SPE=ON	ABB=ON	PLU=ON	L25 AND L17			
L50	0	SEA SPE=ON	ABB=ON	PLU=ON	L26 AND L18			
L51	0	SEA SPE=ON	ABB=ON	PLU=ON	L27 AND L19			
L52	1	SEA SPE=ON	ABB=ON	PLU=ON	L28 AND L20			

TOTAL FOR ALL FILES

L53 1 SEA SPE=ON ABB=ON PLU=ON L29 AND L21  
D L27 KWIC

FILE 'ZCAPLUS' ENTERED AT 13:21:38 ON 16 SEP 2009

L54 QUE SPE=ON ABB=ON PLU=ON BATTERY# OR BATTERIES# OR  
ELECTROCHEM? (2A) CELL#

FILE 'JAPIO, PASCAL, ENERGY, INSPEC, COMPENDEX, WPIX, HCAPLUS'  
ENTERED AT 13:22:36 ON 16 SEP 2009

L55 0 SEA SPE=ON ABB=ON PLU=ON L54 AND L22  
L56 0 SEA SPE=ON ABB=ON PLU=ON L54 AND L23  
L57 1 SEA SPE=ON ABB=ON PLU=ON L54 AND L24  
L58 0 SEA SPE=ON ABB=ON PLU=ON L54 AND L25  
L59 0 SEA SPE=ON ABB=ON PLU=ON L54 AND L26  
L60 11 SEA SPE=ON ABB=ON PLU=ON L54 AND L27  
L61 20 SEA SPE=ON ABB=ON PLU=ON L54 AND L28

TOTAL FOR ALL FILES

L62 32 SEA SPE=ON ABB=ON PLU=ON L54 AND L29

FILE 'ZCAPLUS' ENTERED AT 13:24:39 ON 16 SEP 2009

L63 QUE SPE=ON ABB=ON PLU=ON DIMETHYL#(W)MALONATE#

FILE 'REGISTRY' ENTERED AT 13:24:56 ON 16 SEP 2009

L64 1 SEA SPE=ON ABB=ON PLU=ON 108-59-8

FILE 'JAPIO, PASCAL, ENERGY, INSPEC, COMPENDEX, WPIX, HCAPLUS'  
ENTERED AT 13:26:17 ON 16 SEP 2009

L65 42 SEA SPE=ON ABB=ON PLU=ON L64 OR L63  
L66 91 SEA SPE=ON ABB=ON PLU=ON L64 OR L63  
L67 12 SEA SPE=ON ABB=ON PLU=ON L64 OR L63  
L68 9 SEA SPE=ON ABB=ON PLU=ON L64 OR L63  
L69 96 SEA SPE=ON ABB=ON PLU=ON L64 OR L63  
L70 292 SEA SPE=ON ABB=ON PLU=ON L64 OR L63  
L71 5246 SEA SPE=ON ABB=ON PLU=ON L64 OR L63

TOTAL FOR ALL FILES

L72 5788 SEA SPE=ON ABB=ON PLU=ON L64 OR L63  
L73 0 SEA SPE=ON ABB=ON PLU=ON L14 AND L65 AND L30  
L74 0 SEA SPE=ON ABB=ON PLU=ON L15 AND L66 AND L31  
L75 0 SEA SPE=ON ABB=ON PLU=ON L16 AND L67 AND L32  
L76 0 SEA SPE=ON ABB=ON PLU=ON L17 AND L68 AND L33  
L77 0 SEA SPE=ON ABB=ON PLU=ON L18 AND L69 AND L34  
L78 0 SEA SPE=ON ABB=ON PLU=ON L19 AND L70 AND L35  
L79 2 SEA SPE=ON ABB=ON PLU=ON L20 AND L71 AND L36

TOTAL FOR ALL FILES

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L80      2 SEA SPE=ON  ABB=ON  PLU=ON  L21 AND L72 AND L37
          D L80 1-2 TI AU KWIC
L81      1 SEA SPE=ON  ABB=ON  PLU=ON  L65 AND L54
L82      0 SEA SPE=ON  ABB=ON  PLU=ON  L66 AND L54
L83      0 SEA SPE=ON  ABB=ON  PLU=ON  L67 AND L54
L84      0 SEA SPE=ON  ABB=ON  PLU=ON  L68 AND L54
L85      0 SEA SPE=ON  ABB=ON  PLU=ON  L69 AND L54
L86      6 SEA SPE=ON  ABB=ON  PLU=ON  L70 AND L54
L87      16 SEA SPE=ON  ABB=ON  PLU=ON  L71 AND L54
TOTAL FOR ALL FILES
L88      23 SEA SPE=ON  ABB=ON  PLU=ON  L72 AND L54
L89      1 SEA SPE=ON  ABB=ON  PLU=ON  L81 OR L55
L90      0 SEA SPE=ON  ABB=ON  PLU=ON  L82 OR L56
L91      1 SEA SPE=ON  ABB=ON  PLU=ON  L83 OR L57
L92      0 SEA SPE=ON  ABB=ON  PLU=ON  L84 OR L58
L93      0 SEA SPE=ON  ABB=ON  PLU=ON  L85 OR L59
L94      15 SEA SPE=ON  ABB=ON  PLU=ON  L86 OR L60
L95      32 SEA SPE=ON  ABB=ON  PLU=ON  L87 OR L61
TOTAL FOR ALL FILES
L96      49 SEA SPE=ON  ABB=ON  PLU=ON  L88 OR L62
L97      41 DUP REMOV L96 (8 DUPLICATES REMOVED)
          ANSWER '1' FROM FILE JAPIO
          ANSWER '2' FROM FILE ENERGY
          ANSWERS '3-16' FROM FILE WPIX
          ANSWERS '17-41' FROM FILE HCAPLUS
          D L97 14 KWIC

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FILE 'ZCAPLUS' ENTERED AT 13:30:32 ON 16 SEP 2009

FILE HOME

FILE HCAPLUS

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FILE COVERS 1907 - 16 Sep 2009 VOL 151 ISS 12  
 FILE LAST UPDATED: 15 Sep 2009 (20090915/ED)  
 REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2009

USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2009

HCAPLUS now includes complete International Patent Classification (I) reclassification data for the third quarter of 2009.

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This file contains CAS Registry Numbers for easy and accurate substance identification.

The ALL, BIB, MAX, and STD display formats in the CA/CAPLUS family of databases have been updated to include new citing references information. This enhancement may impact record import into database management software. For additional information, refer to NEWS 9.

#### FILE REGISTRY

Property values tagged with IC are from the ZIC/VINITI data file provided by InfoChem.

STRUCTURE FILE UPDATES: 14 SEP 2009 HIGHEST RN 1184350-41-1

DICTIONARY FILE UPDATES: 14 SEP 2009 HIGHEST RN 1184350-41-1

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TSCA INFORMATION NOW CURRENT THROUGH June 26, 2009.

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FILE COVERS 1907 - 16 Sep 2009 VOL 151 ISS 12  
FILE LAST UPDATED: 15 Sep 2009 (20090915/ED)  
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Jun 2009  
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Jun 2009

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FILE JAPIO  
FILE LAST UPDATED: 28 AUG 2009 <20090828/UP>  
MOST RECENT PUBLICATION DATE: 28 MAY 2009 <20090528/PD>  
>>> GRAPHIC IMAGES AVAILABLE <<<

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION (SLART) IS AVAILABLE  
IN THE BASIC INDEX (/BI) FIELD <<<

FILE PASCAL  
FILE LAST UPDATED: 14 SEP 2009 <20090914/UP>  
FILE COVERS 1977 TO DATE.

>>> SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE  
IN THE BASIC INDEX (/BI) FIELD <<<

FILE ENERGY  
FILE LAST UPDATED: 4 SEP 2009 <20090904/UP>  
FILE COVERS 1974 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN  
THE BASIC INDEX >>>

FILE INSPEC  
FILE LAST UPDATED: 14 SEP 2009 <20090914/UP>  
FILE COVERS 1898 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION AVAILABLE IN  
THE ABSTRACT (/AB), BASIC INDEX (/BI) AND TITLE (/TI) FIELDS >>

FILE COMPENDEX  
FILE LAST UPDATED: 15 SEP 2009 <20090915/UP>  
FILE COVERS 1970 TO DATE.

<<< SIMULTANEOUS LEFT AND RIGHT TRUNCATION IS AVAILABLE IN  
THE BASIC INDEX (/BI), ABSTRACT (/AB), and TITLE (/TI) FIELDS >

<<< Reloaded and enhanced COMPENDEX file is now available  
- see 'HELP RLOAD' for details <<<

FILE WPIX  
FILE LAST UPDATED: 15 SEP 2009 <20090915/UP>  
MOST RECENT UPDATE: 200959 <200959/DW>  
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE  
>>> Now containing more than 1.4 million chemical structures in DCR

>>> IPC, ECLA, US National Classifications and Japanese F-Terms  
and FI-Terms have been updated with reclassifications to  
mid-June 2009.  
No update date (UP) has been created for the reclassified  
documents, but they can be identified by  
specific update codes (see HELP CLA for details)<<<

FOR A COPY OF THE DERWENT WORLD PATENTS INDEX STN USER GUIDE,  
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[http://www.stn-international.com/stn\\_guide.html](http://www.stn-international.com/stn_guide.html)

FOR DETAILS OF THE PATENTS COVERED IN CURRENT UPDATES, SEE  
<http://scientific.thomsonreuters.com/support/patents/coverage/latest>

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[http://www.stn-international.com/DWPIAnaVist2\\_0608.html](http://www.stn-international.com/DWPIAnaVist2_0608.html)

>>> HELP for European Patent Classifications see HELP ECLA, HELP ICO

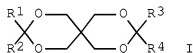
Manual Code Revision  
Thomson Reuters is asking for customer input for the 2010 manual cod  
revision of the Electrical Patents Index (EPI) and Chemical Patents  
Index (CPI) Manual Codes. Read more at  
[http://go.thomsonreuters.com/dwpi\\_code-revision](http://go.thomsonreuters.com/dwpi_code-revision)

=> d 180 1-2 bib abs hitstr hitind

YOU HAVE REQUESTED DATA FROM FILE 'HCAPLUS' - CONTINUE? (Y)/N:y

L80 ANSWER 1 OF 2 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2007:1116646 HCAPLUS Full-text  
 DN 147:430251  
 TI Nonaqueous electrolyte solution and secondary nonaqueous electrolyte battery  
 IN Kotado, Minoru; Sakata, Yuichi; Kinoshita, Shinichi  
 PA Mitsubishi Chemical Corp., Japan  
 SO Jpn. Kokai Tokkyo Koho, 23pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

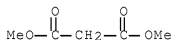
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	---	-----	-----	
PI	JP 2007258103	A	20071004	JP 2006-83877	20060324
PRAI	JP 2006-83877		20060324		
OS	MARPAT 147:430251				
GI					



AB The electrolyte solution has an electrolyte salt dissolved in a nonaq. solvent; where the electrolyte solution comprises  $\geq 1$  1st compound, selected from cyclic anhydrides, cyclic sulfonic esters, dialkenyl dicarboxylate, compound I [R1-4 = H, (F substituted) C1-i2 alkyl group, or (F substituted) alkenyl group], and a boron-containing Li salt, and a dialkyl dicarboxylate. The battery has a Li-intercalating cathode, a Li-intercalating anode, and the above electrolyte solution



IT 108-59-8, Dimethyl malonate  
 872-36-6, Vinylene carbonate  
 1120-71-4, Propane sultone  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte solns. containing dialkyl dicarboxylates for  
 secondary  
 lithium batteries)  
 RN 108-59-8 HCAPLUS  
 CN Propanedioic acid, 1,3-dimethyl ester (CA INDEX NAME)



RN 872-36-6 HCAPLUS  
 CN 1,3-Dioxol-2-one (CA INDEX NAME)



RN 1120-71-4 HCAPLUS  
 CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



IT ~~12190~~-79-3, Cobalt lithium oxide (CoLiO<sub>2</sub>)  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte solns. containing dialkyl dicarboxylates for  
 secondary  
 lithium batteries)  
 RN ~~12190~~-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO2) (CA INDEX NAME)

Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT 78-19-3, 3,9-Divinyl-2,4,8,10-tetraoxaspiro[5,5]undecane 108-31-6,  
 Maleic anhydride, uses 108-59-8, Dimethyl  
 malonate 624-48-6, Dimethyl maleate 624-49-7, Dimethyl  
 fumarate 872-36-6, Vinylene carbonate  
 925-16-6, Diallyl succinate 1120-71-4, Propane sultone  
 14283-07-9, Lithium tetrafluoroborate 244761-29-3  
 RL: MOA (Modifier or additive use); USES (Uses)

(electrolyte solns. containing dialkyl dicarboxylates for  
 secondary  
 lithium batteries)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate  
 623-53-0, Ethyl methyl carbonate 7782-42-5, Graphite, uses  
 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3,  
 Lithium hexafluorophosphate  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolyte solns. containing dialkyl dicarboxylates for

secondary  
 lithium batteries)

L80 ANSWER 2 OF 2 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2005:141448 HCAPLUS Full-text

DN 142:243601

TI Secondary lithium battery and its nonaqueous electrolyte solution

IN Abe, Koji; Miyoshi, Kazuhiro; Kuwata, Takaaki; Matsumori, Yasuo

PA Ube Industries, Ltd., Japan

SO PCT Int. Appl., 36 pp.

CODEN: PIXXD2

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	WO 2005015677	A1	20050217	WO 2004-JP11714	

200408  
 09

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,

CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
 MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,  
 SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
 VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,  
 AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
 DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL,  
 PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
 GW, ML, MR, NE, SN, TD, TG

CN 1836347 A 20060920 CN 2004-80022913

200408  
09

CN 100431217 C 20081105  
 KR 2006060683 A 20060605 KR 2006-702791

200602  
09

US 20060246356 A1 20061102 US 2006-567902

200602  
10

PRAI JP 2003-291129 A 20030811  
 JP 2003-383406 A 20031113  
 WO 2004-JP11714 W 20040809

# ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The battery comprised a cathode, an anode, and a nonaq. electrolyte solution having an electrolyte salt dissolved in a nonaq. solvent mixture; where the cathode is a Li composite oxide containing material, the anode is a graphite containing material; and the electrolyte solution contains a dialkyl oxalate and a vinylene carbonate and/or 1,3-propane sultone.

IT 12057-17-9, Lithium manganese oxide (LiMn2O4) 12190-79-3, Cobalt lithium oxide (CoLiO2)

RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing dialkyl oxalates and vinylene carbonate and/or 1,3-propane sultone for secondary lithium batteries)

RN 12057-17-9 HCAPLUS

CN Lithium manganese oxide (LiMn2O4) (CA INDEX NAME)

Component	Ratio	Component
		Registry Number
O	4	17778-80-2
Mn	2	7439-96-5
Li	1	7439-93-2

RN 12190-79-3 HCAPLUS

CN Cobalt lithium oxide (CoLiO2) (CA INDEX NAME)

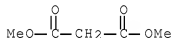
Component	Ratio	Component Registry Number
=====	=====	=====
O	2	17778-80-2
Co	1	7440-48-4
Li	1	7439-93-2

IT 108-59-8, Dimethyl malonate  
 872-36-6, Vinylene carbonate  
 1120-71-4, 1,3-Propane  
 sultone

RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte solns. containing dialkyl oxalates and vinylene  
 carbonate and/or 1,3-propane  
 sultone for secondary lithium batteries)

RN 108-59-8 HCAPLUS

CN Propanedioic acid, 1,3-dimethyl ester (CA INDEX NAME)



RN 872-36-6 HCAPLUS

CN 1,3-Dioxol-2-one (CA INDEX NAME)



RN 1120-71-4 HCAPLUS

CN 1,2-Oxathiolane, 2,2-dioxide (CA INDEX NAME)



IC ICM H01M010-40  
ICS H01M004-58; H01M004-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte additive dialkyl oxalate  
vinylene carbonate; battery electrolyte additive  
propane sultone

IT Battery electrolytes  
(electrolyte solns. containing dialkyl oxalates and vinylene  
carbonate and/or 1,3-propane  
sultone for secondary lithium batteries)

IT Secondary batteries  
(lithium; electrolyte solns. containing dialkyl oxalates and  
vinylene carbonate and/or 1,3  
-propane sultone for secondary lithium  
batteries)

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate  
105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
616-38-6, Dimethyl carbonate 623-53-0, Methyl ethyl carbonate  
7782-42-5, Graphite, uses 12057-17-9, Lithium  
manganese oxide ( $\text{LiMn}_2\text{O}_4$ )  
12190-79-3, Cobalt lithium oxide ( $\text{CoLiO}_2$ ) 14283-07-9,  
Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solns. containing dialkyl oxalates and vinylene  
carbonate and/or 1,3-propane  
sultone for secondary lithium batteries)

IT 108-59-8, Dimethyl malonate  
553-90-2, Dimethyl oxalate 615-52-1, Methyl ethyl oxalate  
872-36-6, Vinylen carbonate  
1120-71-4, 1,3-Propane  
sultone 2050-60-4, Dibutyl oxalate 5132-19-4  
20602-87-3, Dihexyl oxalate 20760-45-6, Dioctyl oxalate  
61764-71-4, Methyl propargyl carbonate 841302-60-1 841302-61-2  
841302-62-3  
RL: MOA (Modifier or additive use); USES (Uses)  
(electrolyte solns. containing dialkyl oxalates and vinylene  
carbonate and/or 1,3-propane  
sultone for secondary lithium batteries)

OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1

## CITINGS)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d 197 1-2 bib abs ind

YOU HAVE REQUESTED DATA FROM FILE 'JAPIO, ENERGY, WPIX, HCAPLUS' - CONTINU  
E? (Y)/N:y

L97 ANSWER 1 OF 41 JAPIO (C) 2009 JPO on STN FAMILY 7  
AN 1996-162154 JAPIO Full-text  
TI SECONDARY BATTERY HAVING NONAQUEOUS SOLVENT ELECTROLYT  
IN HAYASHI KATSUYA; TOBISHIMA SHINICHI; YAMAKI JUNICHI  
PA NIPPON TELEGR & TELEPH CORP <NTT>  
PI JP 08162154 A 19960621 Heisei  
AI JP 1994-324007 (JP06324007 Heisei) 19941202  
PRAI JP 1994-324007 19941202  
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol.  
1996  
AN 1996-162154 JAPIO Full-text  
AB PURPOSE: To provide a lithium secondary battery excellent in high  
voltage resistance and also excellent in charge and discharge  
characteristic of negative electrode. CONSTITUTION: This secondary  
battery has a negative electrode capable of charging and discharging  
lithium ion, a positive electrode capable of performing a reversible  
electrochemical reaction with lithium ion and an electrolyte obtained  
by dissolving an ion-dissociating lithium salt in a nonaqueous  
solvent. As the nonaqueous solvent, dimethyl malonate is used. The  
electrolyte obtained by dissolving 1M of lithium perchlorate  
(LiClO<sub>4</sub>) in dimethyl malonate is preferably used.  
COPYRIGHT: (C)1996,JPO  
IC ICM H01M010-40

L97 ANSWER 2 OF 41 ENERGY COPYRIGHT 2009 USDOE/IEA-ETDE on STN  
AN 2001(17):77901 ENERGY Full-text  
TI Effects of different organic solvents on the performance of a PEMFC  
electrode.  
AU Yang, Tae-Hyun; Park, Gu-gon; Lee, Won-Yong; Choi, Soo-Hyun; Kim,  
Chang Soo (Fuel Cell Research Center, Korea Institute of Energy  
Research, Jang-dong 71-2, Yusong-gu, Taejon 305-343 (Korea))  
SO First European PEFC Forum.  
Editor(s): Buechi, Felix N.; Scherer, Guenther G.; Wokaun,

Alexander (Paul Scherrer Inst., CH-5232 Villigen PSI (CH))  
 Oberrohrdorf: European Fuel Cell Forum. 2001. p. 231-237 of 567 p.  
 4 figs., 5 refs.

Conference: First European PEFC Forum. International Conference  
 with Exhibition, Lucerne (Switzerland), 2 - 6 Jul 2001

ISBN: 3-905592-08-8

DT Book Article; Conference; Numerical Data

CY Switzerland

LA English

FA AB

AB The effects of different organic solvents on the performance of PEMFC electrode were investigated. The five catalyst inks were prepared by mixing the 20 wt% Pt/C (HisPEC 3000 Fuel Cell Catalyst, Johnson Matthey), 5 wt% solubilized Nafion (DuPont), TBAOH, and different organic solvents such as normal butyl acetate, iso-amyl alcohol, diethyl oxalate, ethylene glycol and ethylene glycol dimethyl ether. The TBA<sup>+</sup> formed MEAs were constructed using the transfer screen printing method. The catalyzed membranes were rehydrated and ion-exchanged to the H<sup>+</sup> type by immersing into hot H<sub>2</sub>SO<sub>4</sub> followed by rinsing in deionized water. The performances of single cell with various MEAs were measured and discussed in terms of distribution of Nafion ionomer on Pt particles and robustness of the catalyst structure. (author)

CC \*S30 Direct energy conversion

CT ELECTROCATALYSTS; ELECTRODES; EXPERIMENTAL DATA; ION EXCHANGE MATERIALS; MEMBRANES; ORGANIC SOLVENTS; PERFORMANCE TESTING; PROTON EXCHANGE MEMBRANE FUEL CELLS

CTDE ELEKTROKATALYSATOREN; ELEKTRODEN; EXPERIMENTELLE DATEN; IONENAUSTAUSCHSTOFFE; MEMBRANE; ORGANISCHE LOESUNGSMITTEL; LEISTUNGSPRUEFUNG; PROTONENAUSTAUSCHMEMBRAN-BRENNSTOFFZELLEN

BT CATALYSTS; DATA; DIRECT ENERGY CONVERTERS; ELECTROCHEMICAL CELLS; FUEL CELLS; INFORMATION; MATERIALS; NUMERICAL DATA; SOLID ELECTROLYTE FUEL CELLS; SOLVENTS; TESTING

ET Pt; H; H<sup>+</sup>; H ip 1; ip 1; H\*O\*S; H<sub>2</sub>SO<sub>4</sub>; H cp; cp; S cp; O cp

=> d 197 3-16 full

YOU HAVE REQUESTED DATA FROM FILE 'JAPIO, ENERGY, WPIX, HCAPLUS' - CONTINU  
 E? (Y)/N:y

L97 ANSWER 3 OF 41 WPIX COPYRIGHT 2009  
 DUPLICATE 1

THOMSON REUTERS on STN

AN 2008-M98744 [76] WPIX Full-text

DNC C2008-404788 [76]

DNN N2008-954301 [76]  
 TI Electrolyte for lithium-ion battery, comprises lithium salt and solvent comprising principal constituent which is gamma-valerolactone, methyl isobutyryl acetate, 2-methoxyethyl acetate, 2-ethoxyethyl acetate, or diethyl oxalate  
 DC A85; L03; X16  
 IN HALALAY I C  
 PA (GENK-C) GM GLOBAL TECHNOLOGY OPERATIONS INC; (GMGL-N) GM GLOBAL TECH OPERATIONS INC  
 CYC 41  
 PI US 20080241699 A1 20081002 (200876)\* EN 7[3]  
 CN 101276939 A 20081001 (200876) ZH  
 EP 1978588 A1 20081008 (200876) EN  
 KR 2008088489 A 20081002 (200912) KO  
 ADT US 20080241699 A1 US 2007-692399 20070328; EP 1978588 A1 EP 2008-4102 20080305; CN 101276939 A CN 2008-10087478 20080328; KR 2008088489 A KR 2008-28818 20080328  
 PRAI US 2007-692399 20070328  
 IPCI H01M0010-02 [I,A]; H01M0010-02 [I,C]; H01M0010-36 [I,A]; H01M0010-36 [I,C]; H01M0010-36 [I,C]; H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0010-40 [I,A]; H01M0006-16 [I,A]; H01M0006-16 [I,C]  
 NCL NCLM 429/326.000  
 AB US 20080241699 A1 UPAB: 20090222  
 NOVELTY - An electrolyte comprises a lithium salt and a solvent The solvent comprises a principal constituent (50 volume% or more) which is ( gamma )-valerolactone, methyl isobutyryl acetate, 2-methoxyethyl acetate, 2-ethoxyethyl acetate, or diethyl oxalate.  
 DETAILED DESCRIPTION - An electrolyte comprises a lithium salt and a solvent The solvent comprises a principal constituent (50 volume% or more) which is ( gamma )-valerolactone, methyl isobutyryl acetate, 2-methoxyethyl acetate, 2-ethoxyethyl acetate, or diethyl oxalate. The lithium salt comprises lithium fluorophosphate, lithium borate, lithium imide, lithium fluoroalkylphosphate, or lithium salt with fluorinated anions, preferably lithium hexafluorophosphate, lithium tetrafluoroborate, lithium bis(oxalate)borate, lithium bistrifluoromethylsulfonyl imide (LiN(SO2CF3)2), lithium bisperfluoroethylsulfonyl imide (LiN(SO2C2F5)2), or lithium fluoroalkylphosphate (Li(C2F5)PF3). The solvent further comprises carbonate, ethylene carbonate, dimethyl carbonate, diethyl carbonate, or ethyl methyl carbonate.  
 USE - Electrolyte is used lithium-ion battery (claimed) for consumer electronics and portable computers.  
 ADVANTAGE - The electrolyte provides lithium-ion battery having excellent charging-and-discharging characteristics.  
 FS CPI; EPI  
 MC CPI: A12-E06; L03-E01C2; L03-H03A  
 EPI: X16-A02A; X16-B01F1; X16-J



L97 ANSWER 4 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN  
 DUPLICATE 2  
 AN 2005-163326 [17] WPIX Full-text  
 DNC C2005-052930 [17]  
 DNN N2005-136914 [17]  
 TI Lithium secondary battery has anode containing lithium  
 complex oxide, cathode containing graphite, and non-aqueous  
 electrolyte containing dialkyl oxalate, and  
 vinylene carbonate and/or 1,3-propane sultone  
 L03; X16  
 DC ABE K; KUWATA T; MATSUMORI Y; MIYOSHI K  
 IN (UBEI-C) UBE IND LTD  
 PA 107  
 CYC  
 PI WO 2005015677 A1 20050217 (200517)\* JA 36[0]  
 JP 2005513037 X 20061005 (200667) JA 22  
 US 20060246356 A1 20061102 (200672) EN  
 KR 2006060683 A 20060605 (200674) KO  
 CN 1836347 A 20060920 (200706) ZH  
 CN 100431217 C 20081105 (200936) ZH  
 TW 2005007315 A 20050216 (200958) ZH  
 ADT WO 2005015677 A1 WO 2004-JP11714 20040809; CN 1836347 A CN  
 2004-80022913 20040809; CN 100431217 C CN 2004-80022913 20040809; JP  
 2005513037 X WO 2004-JP11714 20040809; US 20060246356 A1 WO  
 2004-JP11714 20040809; KR 2006060683 A WO 2004-JP11714 20040809; JP  
 2005513037 X JP 2005-513037 20040809; KR 2006060683 A KR 2006-702791  
 20060209; US 20060246356 A1 US 2006-567902 20060210; TW 2005007315 A  
 TW 2004-123962 20040810  
 FDT JP 2005513037 X Based on WO 2005015677 A; KR 2006060683 A  
 Based on WO 2005015677 A  
 PRAI JP 2003-383406 20031113  
 JP 2003-291129 20030811  
 IC ICM H01M010-40  
 IPCI H01M0010-36 [I,C]; H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0010-40  
 [I,A]; H01M0004-02 [I,A]; H01M0004-02 [I,C]; H01M0004-02 [I,A];  
 H01M0004-02 [I,C]; H01M0004-48 [I,A]; H01M0004-48 [I,C]; H01M0004-58  
 [I,A]; H01M0004-58 [I,C]; H01M0004-58 [I,A]; H01M0004-58 [I,C]  
 IPCR H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0004-02 [I,A]; H01M0004-02  
 [I,C]; H01M0004-48 [N,A]; H01M0004-48 [N,C]; H01M0004-58 [N,A];  
 H01M0004-58 [N,C]  
 EPC H01M0004-587; H01M0010-052; H01M0010-0525; H01M0010-0567;  
 H01M0010-0569  
 ICO T01M0004:131; T01M0004:133; T01M0004:485; T01M0004:505;  
 T01M0004:525; T01M0010:0568  
 NCL NCLM 429/326.000  
 NCLS 429/231.100; 429/231.800; 429/329.000; 429/330.000;  
 429/332.000

AB WO 2005015677 A1 UPAB: 20050708  
 NOVELTY - The lithium secondary **battery** has anode, cathode and non-aqueous electrolyte containing **dialkyl oxalate**, and vinylene carbonate and/or 1,3-propane sultone. Anode contains lithium complex oxide, and cathode contains graphite. The non-aqueous electrolyte is obtained by dissolving an electrolyte salt in a non-aqueous solvent.  
 DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for non-aqueous electrolyte.  
 USE - As power supply for electronic device.  
 ADVANTAGE - The lithium secondary **battery** has excellent storage characteristics, long-term cycle characteristics and electrical capacitance.

TECH ORGANIC CHEMISTRY - Preferred Component: The alkyl group of **dialkyl oxalate** is 1-12C alkyl group. Preferred Solvent: The non-aqueous solvent is a mixture of cyclic carbonates, and linear carbonates or lactone, preferably mixture of propylene carbonate and dimethyl carbonate, or ethylene carbonate, and methyl ethyl carbonate, diethyl carbonate or (gamma)-butyrolactone.

FS CPI; EPI  
 MC CPI: L03-E01B5B; L03-E01B5C; L03-E01C2; L03-E01C4  
 EPI: X16-B01F1; X16-E01C; X16-E01C1; X16-E08; X16-J02; X16-J08

L97 ANSWER 5 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN  
 DUPLICATE 3

AN 2006-004478 [01] WPIX Full-text  
 DNC C2006-001800 [01]  
 DNN N2006-003623 [01]

TI Electrolyte liquid for **battery**, such as lithium ion secondary cell, contains silane-coupling agent and oxalate

DC L03; X16  
 IN ICHIHASHI A  
 PA (SONY-C) SONY CORP  
 CYC 1

PI JP 2005339900 A 20051208 (200601)\* JA 18[16]  
 ADT JP 2005339900 A JP 2004-155018 20040525  
 PRAI JP 2004-155018 20040525  
 IPCR H01M0010-36 [I,C]; H01M0010-40 [I,A]  
 FCL H01M0010-00 112; H01M0010-40 A

FTRM 5H029; 5H029/AJ02; 5H029/AK01; 5H029/AK03; 5H029/AK05; 5H029/AK18;  
 5H029/AL01; 5H029/AL02; 5H029/AL06; 5H029/AL07; 5H029/AL11;  
 5H029/AL12; 5H029/AL16; 5H029/AL18; 5H029/AM03; 5H029/AM04;  
 5H029/AM05; 5H029/AM07; 5H029/HJ01

AB JP 2005339900 A UPAB: 20060125  
 NOVELTY - An electrolyte liquid contains a silane-coupling agent and oxalate.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for battery equipped with an anode (21), a cathode (22) and electrolyte liquid.

USE - For battery (claimed) such as lithium ion secondary cell used as power supply of portable electronic devices, such as mobile telephone, personal digital assistant, personal portable information terminal device and notebook-type computer.

ADVANTAGE - The electrolyte liquid improves charging and discharging efficiency and load characteristics of battery .

DESCRIPTION OF DRAWINGS - The figure shows a sectional drawing of structure of secondary battery. (Drawing includes non-English language text).

battery can (11)  
insulation board (12,13)  
anode (21)  
cathode (22)

TECH ORGANIC CHEMISTRY - Preferred Composition: The electrolyte liquid contains silane-coupling agent (0.5-2 mass%) and oxalate (0.2-5 mass%).

ABEX SPECIFIC COMPOUNDS - The silane-coupling agent is vinyl triethoxy silane, 3-acryloxy propyl trimethoxy silane and/or 3-methacryloxy propyl triethoxy silane (claimed). The oxalate is dimethyl oxalate and/or diethyl oxalate (claimed).

FS CPI; EPI

MC CPI: L03-E01C2

EPI: X16-B01F1; X16-J02; X16-J08

L97 ANSWER 6 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN  
DUPLICATE 4

AN 2004-410651 [38] WPIX Full-text

DNC C2004-154079 [38]

DNN N2004-326154 [38]

TI Non-aqueous electrolytic solution for lithium battery used in portable electronic devices, e.g. camcorders, contains lithium salt, organic solvent, and compound(s) comprising acetate compound and/or malonate compound

DC E19; L03; X16

IN CHO M; CHO M D; KIM J; KIM J Y; RYU E; RYU Y; RYU Y G

PA (SMSU-C) SAMSUNG DENKAN KK; (SMSU-C) SAMSUNG SDI CO LTD

CYC 4

PI US 20040096750 A1 20040520 (200438)\* EN 12[4]

JP 2004172120 A 20040617 (200440) JA 16

KR 2004043228 A 20040524 (200460) KO

CN 1501541 A 20040602 (200465) ZH

CN 1264243 C 20060712 (200678) ZH

US 7312001 B2 20071225 (200803) EN

JP 4226446 B2 20090218 (200914) JA 14

KR 875112 B1 20081222 (200914) KO

ADT US 20040096750 A1 US 2003-669464 20030925; KR 2004043228 A KR 2002-71397 20021116; CN 1501541 A CN 2003-158727 20030922; CN 1264243 C CN 2003-158727 20030922; JP 2004172120 A JP 2003-385057 20031114; KR 875112 B1 KR 2002-71397 20021116; JP 4226446 B2 JP 2003-385057 20031114

FDT JP 4226446 B2 Previous Publ JP 2004172120 A; KR 875112 B1 Previous Publ KR 2004043228 A

PRAI KR 2002-71397 20021116

IC ICM H01M010-40

IPCI H01B0001-12 [I,A]; H01B0001-12 [I,C]; H01M0010-36 [I,A]; H01M0010-36 [I,C]; H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0010-40 [I,A]; H01M0004-36 [I,C]; H01M0004-38 [I,A]; H01M0004-38 [I,C]; H01M0004-40 [I,A]; H01M0004-40 [I,C]; H01M0004-60 [I,A]; H01M0006-16 [I,A]; H01M0006-16 [I,C]

IPCR H01B0001-12 [I,A]; H01B0001-12 [I,C]; H01M0010-36 [I,A]; H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0004-02 [I,A]; H01M0004-02 [I,C]; H01M0004-36 [I,C]; H01M0004-38 [I,A]; H01M0004-38 [I,C]; H01M0004-40 [I,A]; H01M0004-40 [I,C]; H01M0004-48 [I,A]; H01M0004-48 [I,C]; H01M0004-58 [I,A]; H01M0004-58 [I,C]; H01M0004-60 [I,A]; H01M0006-16 [N,A]; H01M0006-16 [N,C]

EPC H01M0010-052; H01M0010-0567; H01M0010-0568; H01M0010-40E5

ICO T01M0004:136; T01M0004:58B2; T01M0004:60M; T01M0006:16E1M4; T01M0010:0569; T01M0010:40L

NCL NCLM 429/326.000

NCLS 429/218.100; 429/231.100; 429/231.950; 429/332.000

FCL H01M0010-00 102; H01M0010-00 112; H01M0010-00 113; H01M0010-00 114; H01M0010-40 A; H01M0004-02 C; H01M0004-02 D; H01M0004-38 Z; H01M0004-40; H01M0004-58; H01M0004-58 101; H01M0004-60

Main: H01M0010-00 112

Secondary: H01M0010-00 102; H01M0010-00 113; H01M0010-00 114; H01M0004-38 Z; H01M0004-40; H01M0004-60

FTRM 5H029; 5H050; 5H050/AA08; 5H050/AA12; 5H029/AJ03; 5H029/AJ06; 5H029/AK01; 5H029/AK03; 5H029/AK05; 5H029/AK16; 5H029/AL04; 5H029/AL12; 5H029/AM02; 5H029/AM03; 5H029/AM04; 5H029/AM05; 5H029/AM07; 5H050/BA16; 5H050/BA17; 5H029/BJ03; 5H029/BJ14; 5H050/CA01; 5H050/CA07; 5H050/CA11; 5H050/CA26; 5H050/CB12; 5H050/CB26; 5H050/HA02; 5H050/HA10; 5H029/HJ02; 5H029/HJ10

AB US 20040096750 A1 UPAB: 20090307

NOVELTY - A non-aqueous electrolytic solution includes a lithium salt; an organic solvent; and compound(s) comprising acetate compound and/or malonate compound.

DETAILED DESCRIPTION - A non-aqueous electrolytic solution comprises a lithium salt; an organic solvent; and compound(s) of formula (1).

R1CH2C(O)OR2 (1)

R1 = H, halo, OH, optionally substituted 1-20C alkyl, optionally substituted 1-20C alkoxy, optionally substituted 1-20C alkenyl, optionally substituted 6-30C aryl, optionally substituted 6-30C aryloxy, optionally substituted 2-30C heteroaryl, optionally substituted 2-30C heteroaryloxy, or R30-C(0)-;

R3 = H, halo, optionally substituted 1-20C alkyl, optionally substituted 1-20C alkenyl, optionally substituted 6-30C aryl, or optionally substituted 2-30C heteroaryl; and

R2 = H, halo, optionally substituted 1-20C alkyl, optionally substituted 1-20C alkenyl, optionally substituted 6-30C aryl, or optionally substituted 2-30C heteroaryl.

USE - For lithium battery having a cathode, an anode, and a separator (claimed), used in portable electronic devices, e.g. camcorders, portable communication devices, or portable computers.

ADVANTAGE - The inventive non-aqueous electrolytic solution is less reactive with lithium and improves the conductivity of lithium ions and the charge/discharge efficiency of lithium batteries.

TECH ORGANIC CHEMISTRY - Preferred Component: At least one of the compounds (1) (0.01-5 pbw) is also a compound of formulae (2) and/or (3).

R4CH2C(0)OR2 (2)

R5OC(0)CH2C(0)OR2 (3)

R4 = H, halo, OH, optionally substituted 1-20C alkyl, optionally substituted 1-20C alkoxy, optionally substituted 1-20C alkenyl, optionally substituted 6-30C aryl, optionally substituted 6-30C aryloxy, optionally substituted 2-30C heteroaryl, or optionally substituted 2-30C heteroaryloxy; and

R5 = H, halo, optionally substituted 1-20C alkyl, optionally substituted 1-20C alkenyl, optionally substituted 6-30C aryl, or optionally substituted 2-30C heteroaryl.

The compound (2) is dimethyl acetate, methylethyl acetate, methylbutyl acetate, diethyl acetate, ethylmethyl acetate, ethylbutyl acetate, dibutyl acetate, butylethyl acetate, or butylmethyl acetate.

The compound (3) is dimethyl malonate, methylethyl malonate, methylbutyl malonate, diethyl malonate, ethylmethyl malonate, ethylbutyl malonate, dibutyl malonate, butylethyl malonate, or butylmethyl malonate.

The organic solvent is polyglyme, dioxolane, carbonate, 2-fluorobenzene, 3-fluorobenzene, 4-fluorobenzene, dimethoxyethane, or diethoxyethane.

The polyglyme is diethyleneglycol dimethylether, diethyleneglycol diethylether, triethyleneglycol dimethylether, or triethyleneglycol diethylether.

The dioxolane is 1,3-dioxolane, 4,5-diethyl-dioxolane, 4,5-dimethyl-dioxolane, 4-methyl-1,3-dioxolane, or 4-ethyl-1,3-dioxolane.

The carbonate is methylene carbonate, ethylene carbonate, diethyl carbonate, dimethyl carbonate, gamma-butyrolactone, propylene carbonate, methylethyl carbonate, or vinylene carbonate.  
 INORGANIC CHEMISTRY - Preferred Composition: The lithium salt is 0.5-2.0 M.

ABEX EXAMPLE - Lithium metal electrodes were used for a cathode and an anode. A polyethylene separator was interposed between the cathode and the anode to manufacture an electrode assembly by sequential stacking. The electrode assembly was placed in a battery case, and a non-aqueous electrolyte was injected into the battery case to provide a complete lithium ion secondary battery. The non-aqueous electrolyte contained 1.15 M hexafluorophosphoric acid lithium, a mixture of ethylene carbonate, dimethylcarbonate, ethylmethyl carbonate, and propylene carbonate in a ratio of 3:3:3:1 by volume, and 0.01 pbw dimethyl malonate.

FS CPI; EPI  
 MC CPI: E06-H; E07-H; E10-C02F; E10-C03; E10-C04C; E10-C04D4;  
 E10-C04J2U; E10-E04K; E10-G02F1; E10-G02G1; E10-G02G2;  
 E10-G02H1; E10-G02H2; E33-G; L03-E01C2; L03-E01C4; L03-H03  
 EPI: X16-B01F1; X16-J02; X16-J08

L97 ANSWER 7 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN  
 DUPLICATE 5

AN 2004-366552 [35] WPIX Full-text  
 DNC C2004-138553 [35]  
 DNN N2004-293165 [35]

TI Organic electrolytic solution for use in lithium battery,  
 comprises lithium salt, organic solvent and oxalate compound

DC E19; L03; X16

IN CHO M; CHO M D; CHO M S; KIM J; KIM J Y; RYU E; RYU Y; RYU Y G; CHO  
 M 1 S

PA (SMSU-C) SAMSUNG DENKAN KK; (SMSU-C) SAMSUNG SDI CO LTD  
 CYC 35

PI EP 1420474 A1 20040519 (200435)\* EN 19[8]  
 US 20040096749 A1 20040520 (200435) EN  
 JP 2004172117 A 20040617 (200440) JA 16  
 KR 2004043045 A 20040522 (200460) KO  
 CN 1501540 A 20040602 (200465) ZH  
 CN 1274053 C 20060906 (200706) ZH  
 EP 1420474 B1 20080319 (200822) EN  
 DE 60319786 E 20080430 (200831) DE  
 JP 4083663 B2 20080430 (200831) JA 16  
 US 7445872 B2 20081104 (200875) EN  
 DE 60319786 T2 20081127 (200882) DE

ADT EP 1420474 A1 EP 2003-254063 20030626; KR 2004043045 A KR 2002-71043  
 20021115; US 20040096749 A1 US 2003-601907 20030624; US 7445872 B2

US 2003-601907 20030624; DE 60319786 E DE 2003-60319786 20030626; DE 60319786 E EP 2003-254063 20030626; CN 1501540 A CN 2003-148467 20030630; CN 1274053 C CN 2003-148467 20030630; JP 2004172117 A JP 2003-382538 20031112; JP 4083663 B2 JP 2003-382538 20031112; DE 60319786 T2 DE 2003-60319786 20030626; DE 60319786 T2 EP 2003-254063 20030626

FDT DE 60319786 E Based on EP 1420474 A; JP 4083663 B2  
Previous Publ JP 2004172117 A; DE 60319786 T2 Based on EP 1420474 A

PRAI KR 2002-71043 20021115

IC ICM H01M010-40

IPCI H01M0010-36 [I,A]; H01M0010-36 [I,C]; H01M0010-36 [I,C]; H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0010-40 [I,A]; H01M0004-58 [I,A]; H01M0004-58 [I,C]; H01M0006-16 [I,C]; H01M0006-16 [I,A]; H01M0006-16 [I,C]; H01M0006-16 [I,A]; H01M0006-16 [I,C]

IPCR H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0002-16 [N,A]; H01M0002-16 [N,C]; H01M0004-02 [I,A]; H01M0004-02 [I,C]; H01M0004-40 [I,A]; H01M0004-40 [I,C]; H01M0004-58 [I,A]; H01M0004-58 [I,C]; H01M0006-16 [I,A]; H01M0006-16 [I,C]

EPC H01M0004-02B; H01M0004-58B; H01M0010-052; H01M0010-0567; H01M0010-0569; H01M0010-40E1; H01M0010-40E3

ICO T01M0002:16C3; T01M0010:0525; T01M0010:0565

NCL NCLM 429/324.000  
NCLS 429/231.800; 429/231.950; 429/329.000; 429/331.000; 429/332.000

FCL H01M0010-00 102; H01M0010-00 112; H01M0010-00 114; H01M0010-40 A  
Main: H01M0010-00 112  
Secondary: H01M0010-00 102; H01M0010-00 114

FTRM 5H029; 5H029/AJ02; 5H029/AJ03; 5H029/AK03; 5H029/AK05; 5H029/AL06; 5H029/AL07; 5H029/AL12; 5H029/AM02; 5H029/AM04; 5H029/AM05; 5H029/AM07; 5H029/BJ03; 5H029/HJ01; 5H029/HJ02; 5H029/HJ10

AB EP 1420474 A1 UPAB: 20050529  
NOVELTY - An organic electrolytic solution comprises a lithium salt, an organic solvent and an oxalate compound.  
DETAILED DESCRIPTION - An organic electrolytic solution comprises a lithium salt, an organic solvent and an oxalate compound of formula (1).  
R1, R2 = H, halo, hydroxy, or optionally substituted (1-20C alkyl, 1-20C alkoxy, 1-20C alkenyl, 6-30C aryl, 6-30C arylalkyl, 6-30C aryloxy, 2-30C hetero aryl, 2-30C hetero arylalkyl, 2-30C hetero aryloxy, 5-20C cycloalkyl, or 2-20C heterocycloalkyl).  
An INDEPENDENT CLAIM is also included for a lithium battery comprising a cathode, an anode, a separator interposed between the cathode and the anode, and the above organic electrolytic solution.  
USE - For use in lithium battery (claimed).

ADVANTAGE - The oxalate compound forms a chelate with lithium ions and improves the ionic conductivity and the charging/discharging efficiency of the **battery**. The chelation of the lithium ions provides negative sulfur ions to remain free without interaction with lithium ions and highly likely to dissolve in the electrolytic solution thus increasing a reversible capacity of sulfur.

TECH ELECTRICAL POWER AND ENERGY - Preferred Component: The anode is formed as a lithium metal electrode, a lithium metal alloy electrode, a lithium-inert sulfur composite electrode, a carbonaceous electrode, or a graphite electrode.

INORGANIC CHEMISTRY - Preferred Material: The cathode is formed of lithium composite oxide, simple substance sulfur, kasolite containing  $\text{Li}_2\text{Sn}$  (where n is at least 1), organo-sulfur, or  $(\text{C}_2\text{Sx})_y$  (where x is 2.5-20 and y is at least 2). The lithium salt has a concentration of 0.5-2 M.

ORGANIC CHEMISTRY - Preferred Compound: The oxalate compound is **diethyl oxalate**, **dimethyl oxalate**, **dipropyl oxalate**, **dibutyl oxalate**, or **bis-(4-methylbenzyl) oxalate**. The organic solvent is polyglyme, dioxolane, carbonate, 2-fluorobenzene, 3-fluorobenzene, 4-fluorobenzene, dimethoxyethane, diethoxyethane, and/or sulfolane. The polyglyme is diethyleneglycol dimethylether ( $\text{CH}_3(\text{OCH}_2\text{CH}_2)_2\text{OCH}_3$ ), diethyleneglycol diethylether ( $\text{C}_2\text{H}_5(\text{OCH}_2\text{CH}_2)_2\text{OC}_2\text{H}_5$ ), triethyleneglycol dimethylether ( $\text{CH}_3(\text{OCH}_2\text{CH}_2)_3\text{OCH}_3$ ), or triethyleneglycol diethylether ( $\text{C}_2\text{H}_5(\text{OCH}_2\text{CH}_2)_3\text{OC}_2\text{H}_5$ ). The dioxolane is 1,3-dioxolane, 4,5-diethyl-dioxolane, 4,5-dimethyl-dioxolane, 4-methyl-1,3-dioxolane, and/or 4-ethyl-1,3-dioxolane. The carbonate for the organic solvent is at least 2 of ethylene carbonate, methylene carbonate, diethyl carbonate, dimethyl carbonate, gamma-butyrolactone, propylene carbonate, methyl ethyl carbonate, and/or vinylene carbonate. The organic solvent includes sulfolane, dimethoxyethane, and/or diethoxyethane.

Preferred Composition: The oxalate compound is present at 0.001-10 pbw with respect to 100 pbw the organic solvent. The organic solvent is a mixture of the polyglyme and the dioxolane in a ratio of 1:9-9:1 by volume.

ABEX EXAMPLE - An electrode assembly including a cathode, an anode and a polyethylene separator between the cathode and the anode was produced. Lithium method electrodes were used for the cathode and anode. The electrode assembly was sealed in a **battery** case and an organic electrolytic solution was injected to provide a complete lithium **battery**. The organic electrolytic solution containing 1 M lithium sulfate-containing compound ( $\text{LiCF}_3\text{SO}_3$ ) as a lithium salt, a mixture of 1,3-dioxane, diglyme, dimethoxyethane, and sulfolane in a ratio of 50:20:20:10 by volume as an organic solvent and 0.05 pbw dimethyl oxalate.

FS CPI; EPI



MC CPI: E05-A; E06-H; E07-H; E10-A02; E10-A04B1B; E10-A04B2B;  
 E10-A04B2C; E10-A09B8; E10-C02D1; E10-G02F1; E10-G02F2;  
 E10-G02G2; L03-E01C2  
 EPI: X16-A02; X16-B01F

L97 ANSWER 8 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN  
 DUPLICATE 6

AN 2003-816511 [77] WPIX Full-text

DNC C2003-227588 [77]

DNN N2003-653545 [77]

TI An electrolytic solution used for a secondary battery is  
 formed by dissolving lithium salt in a non-aqueous solvent

DC E13; E17; E34; L03; X16

IN OKAHARA K; SHIMA K; SHIZUKA K

PA (MITU-C) MITSUBISHI CHEM CORP

CYC 1

PI JP 2002367673 A 20021220 (200377)\* JA 8[0]

ADT JP 2002367673 A JP 2001-170704 20010606

PRAI JP 2001-170704 20010606

IPCR H01M0010-36 [I,C]; H01M0010-40 [I,A]

FCL H01M0010-40 A

FTRM 5H029; 5H029/AJ02; 5H029/AJ03; 5H029/AJ05; 5H029/AJ12; 5H029/AK03;  
 5H029/AL02; 5H029/AL06; 5H029/AL07; 5H029/AL12; 5H029/AL18;  
 5H029/AM03; 5H029/AM04; 5H029/AM05; 5H029/AM07; 5H029/HJ01;  
 5H029/HJ02

AB JP 2002367673 A UPAB: 20050531

NOVELTY - An electrolytic solution is formed by dissolving a lithium  
 salt in a non-aqueous solvent containing carbonate ester, ether, or  
 lactone as its major constituent.

DETAILED DESCRIPTION - An electrolytic solution is formed by  
 dissolving a lithium salt in a non-aqueous solvent containing  
 carbonate ester, ether, or lactone as its major constituent. The  
 carbonate ester is present as a dicarboxylate diester (except diester  
 oxalate and diester succinate) or its derivative, 0.1-5 weight%.

USE - The electrolytic solution is used for a secondary  
 battery.

ADVANTAGE - The electrolytic solution enhances battery  
 characteristics, including cycle characteristics, rate  
 characteristics, capacity, and safety in overcharge. The same is true  
 for the secondary battery.

TECH ORGANIC CHEMISTRY - Preferred Composition: The dicarboxylate diester  
 is represented by formula (1) or (2).

R1, R2 = 1-10C alkyl or halo-substituted alkyl;

n = integer of 1 or 3-10;

R3, R4 = 1-10C alkyl or halo-substituted alkyl;

p, q = integer of 0-5; and

p+q = greater than or equal to 0 and less than or equal to 10.

The dicarboxylate diester is chosen from malonic acid diester, maleic acid diester, and fumaric acid diester.

Preferred Products: A secondary battery has the electrolytic solution, a positive electrode, and a negative electrode.

ABEX SPECIFIC COMPOUNDS - The dicarboxylate diester is specifically claimed as dimethyl malonate, diethyl malonate, dipropyl malonate, dibutyl malonate, malonic acid bis(fluoromethyl), malonic acid bis(difluoromethyl), malonic acid bis(trifluoromethyl), dimethyl maleate, diethyl maleate, dipropyl maleate, dibutyl maleate, maleic acid bis(fluoromethyl), maleic acid bis(difluoromethyl), maleic acid bis(trifluoromethyl), dimethyl fumarate, diethyl fumarate, dipropyl fumarate, dibutyl fumarate, fumaric acid bis(fluoromethyl), fumaric acid bis(difluoromethyl), and fumaric acid bis(trifluoromethyl).

FS CPI; EPI

MC CPI: E07-A02B; E07-A02C; E07-A02F; E07-A02G; E10-G02G1; E10-G02G2; E10-H01; E33-G; L03-E01C2  
EPI: X16-B01F; X16-J08

L97 ANSWER 9 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN  
AN 2009-M45833 [55] WPIX Full-text

TI Manufacture of difluoro malonic acid diester compound useful as solvent or additive for electrolyte solution used for lithium ion batteries involves contacting and mixing difluoro malonic acid monoester compound and alcohol

DC E16; L03; X16

IN OSADA K; UEMATSU N

PA (ASAH-C) ASahi KASEI KK

CYC 1

PI JP 2009179578 A 20090813 (200955)\* JA 9[0]

ADT JP 2009179578 A JP 2008-18832 20080130

PRAI JP 2008-18832 20080130

IPCI C07C0067-00 [I,C]; C07C0067-14 [I,A]; C07C0069-00 [I,C]; C07C0069-63 [I,A]; H01M0010-36 [N,A]; H01M0010-36 [N,C]

FCL Main: C07C0067-14

Secondary: C07C0069-63

Additional: H01M0010-00 112; H01M0010-00 114

FTRM 4H006; 5H029; 4H006/AA02; 4H006/AC48; 5H029/AJ07; 5H029/AJ12; 5H029/AM02; 4H006/BB12; 4H006/BM71; 5H029/HJ02; 4H006/KA14; 4H006/KC12

AB JP 2009179578 A UPAB: 20090826

NOVELTY - A difluoro malonic acid diester compound is manufactured by contacting and mixing difluoro malonic acid monoester compound and alcohol.

DETAILED DESCRIPTION - A difluoro malonic acid diester compound of formula R2OCO-CF2-COOR3 (3) is manufactured by contacting

and mixing difluoro malonic acid monoester compound of formula YCO-CF<sub>2</sub>-COOR<sub>1</sub> (1) and alcohol of formula R<sub>2</sub>OH (2).

R<sub>1</sub>=1-6C hydrocarbon;

Y=halo;

R<sub>2</sub>=1-10C hydrocarbon or halogen-containing hydrocarbon; and

R<sub>3</sub>=R<sub>1</sub> or R<sub>2</sub>.

USE - Manufacture of difluoro malonic acid diester compound useful as solvent or additive for electrolyte solution used for lithium ion batteries.

ADVANTAGE - The method is industrially inexpensive, and efficiently manufactures difluoro malonic acid diester compound at a high yield.

ABEX DEFINITIONS - Preferred Definitions: - Y=fluorine; and - R<sub>2</sub> and/or R<sub>3</sub>=Me.

EXAMPLE - Difluoro (fluoro formyl) methyl acetate (93.6 g) was placed in 200 ml three necked flask in nitrogen atmosphere, and added and diluted with HFC43-10mee(RTM: Decafluoropentane) (100 ml). The reaction container was immersed in ice bath, slowly dripped with methanol (23 g) so that solution temperature might not be greater than or equal to 10 degrees C, stirred at room temperature for 1 hour, concentrated, vacuum-distilled, and 92.1 g of 2,2'-difluoro dimethyl malonate was obtained.

FS CPI; EPI

MC CPI: E10-G02B1; E11-F06; L03-E01C1; L03-E08C

EPI: X16-B01F1; X16-J

L97 ANSWER 10 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

AN 2009-M42721 [54] WPIX Full-text

TI Electrochemical mixing capacitor, has electrolyte formed between positive pole and negative pole, and supporting electrolyte added to electrolyte, where positive pole is provided with active material

DC L03; V01; X16

IN LI Y; LIU J; YANG C; ZHANG L; ZHANG R; ZHOU S

PA (GUAN-N) GUANGZHOU GODSEND HI TECH CO LTD

CYC 1

PI CN 101494123 A 20090729 (200954)\* ZH 14[2]

ADT CN 101494123 A CN 2009-10037614 20090306

PRAI CN 2009-10037614 20090306

IPCI H01G0009-022 [I,A]; H01G0009-022 [I,C]; H01G0009-042 [I,A];

H01G0009-042 [I,C]; H01G0009-155 [I,A]; H01G0009-155 [I,C]

AB CN 101494123 A UPAB: 20090824

NOVELTY - The capacitor has an electrolyte e.g. lithium salt solution, formed between a positive pole and a negative pole. Active carbon material is utilized as active material of the negative pole. The positive pole is provided with active material e.g. iron series lithium mixing compound. A supporting electrolyte e.g. potassium chloride, is added to the electrolyte. Carbonic ether is made of

carbonic acid vinyl ester, propylene carbonate, methyl carbonate, diethyl carbonate, carbonic acid methyl ethyl oxalate and carbonic acid methyl propyl ester.

USE - Electrochemical mixing capacitor.

ADVANTAGE - The positive pole is a double-layer structure of lithium ion battery and double electrode layer capacitor, so that the performance in electric discharging can be improved. The supporting electrolyte is added into the electrolyte to raise the consistency of the slat and ion electrical conductivity. The electrolyte of the main body is not reduced when the double electrode layer is formed.

DESCRIPTION OF DRAWINGS - The drawing shows a graphical representation of a process involved in an electrochemical mixing capacitor.' (Drawing includes non-English language text)'

FS CPI; EPI

MC CPI: L03-B03A; L03-B03H

EPI: V01-B01A; V01-B01D; X16-J

L97 ANSWER 11 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

AN 2009-E98172 [17] WPIX Full-text

TI Lithium secondary battery comprises cathode, anode, separator and organic electrolyte, where cathode has cathode active material layer containing lithium transition metal oxide and anode has anode active material layer

DC E17; L03; X16

IN BAE Y; LEE H; RYU J

PA (GLDS-C) LG CHEM LTD

CYC 1

PI KR 2008087338 A 20081001 (200917)\* KO 7[2]

ADT KR 2008087338 A KR 2007-29419 20070326

PRAI KR 2007-29419 20070326

IPCI H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0004-36 [I,A]; H01M0004-36 [I,C]; H01M0004-60 [I,A]

AB KR 2008087338 A UPAB: 20090317

NOVELTY - The lithium secondary battery comprises a cathode, an anode, a separator and an organic electrolyte, where cathode has a cathode active material layer containing a lithium transition metal oxide. The anode has an anode active material layer. The separator is interposed between cathode and anode for electrically insulating both electrodes from each other. The organic electrolyte comprises a lithium salt, an organic oxalate compound and an organic solvent. The 0.01-10 weight% of lithium oxalate is additionally provided in the cathode active material layer and anode active material layer.

DETAILED DESCRIPTION - The organic oxalate compound has a formula (I).

R1 and R2=independently 1-20C substituted or non-substituted alkyl group, 1-20C substituted or non-substituted alkoxy or 1-20C substituted or non-substituted alkenyl.

USE - Lithium secondary battery.

ADVANTAGE - The lithium secondary battery prevents degradation of the battery quality caused by electric short circuits resulted by overcharge and overdischarge.

DESCRIPTION OF DRAWINGS - The drawing shows a graphical representation of C-rate performance of the anode. (Drawing includes non-English language text).

TECH ORGANIC CHEMISTRY - Preferred Compounds: The organic oxalate is selected from diethyl oxalate, dimethyl oxalate, dipropyl oxalate or dibutyl oxalate. The organic solvent is selected from polyglyme compound, dioxolane compound, carbonate type solvent, 2-fluorobenzene, 3-fluorobenzene, 4-fluorobenzene, dimethoxyethane, diethoxyethane or sulfuran.

FS CPI; EPI

MC CPI: E31-N04B; E31-N04D; E33-G; E35; L03-E01B5B; L03-E01B9; L03-E01C2; L03-E03; L03-E08C

EPI: X16-B01F1; X16-E01A; X16-E01C1; X16-F02; X16-J

L97 ANSWER 12 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

AN 2007-440292 [42] WPIX Full-text

DNC C2007-160106 [42]

DNN N2007-332171 [42]

TI New composition of matter comprising a N-substituted 3,4-alkylenedioxy pyrrole compound useful for fabrication of variety of products e.g. electrochromic windows, mirrors and displays, electronic paper and anti-stat conductors

DC A97; E13; F09; L03; U11; U12; V04

IN COWART J S; REYNOLDS J R; WALCZAK R M; COWART J; REYNOLDS J; WALCZAK R

PA (UYFL-C) UNIV FLORIDA RES FOUND INC

CYC 116

PI WO 2007041724 A1 20070412 (200742)\* EN 49[10]

EP 1931630 A1 20080618 (200841) EN

KR 2008059287 A 20080626 (200902) KO

JP 2009511505 W 20090319 (200921) JA 28

US 20090149661 A1 20090611 (200939) EN

ADT WO 2007041724 A1 WO 2006-US39958 20061006; EP 1931630 A1 EP 2006-816817 20061006; EP 1931630 A1 PCT Application WO 2006-US39958 20061006; KR 2008059287 A PCT Application WO 2006-US39958 20061006; JP 2009511505 W PCT Application WO 2006-US39958 20061006; JP 2009511505 W JP 2008-534790 20061006; KR 2008059287 A KR 2008-710880 20080506; US 20090149661 A1 Provisional US 2005-724178P 20051006; US 20090149661 A1 PCT Application WO 2006-US39958 20061006; US 20090149661 A1 US 2008-990042 20080408

FDT EP 1931630 A1 Based on WO 2007041724 A; KR 2008059287 A Based on WO 2007041724 A; JP 2009511505 W Based on WO 2007041724

A

PRAI US 2005-724178P 20051006  
 US 2008-990042 20080408

IPCI C07D0207-00 [I,C]; C07D0207-00 [I,C]; C07D0207-00 [I,C]; C07D0207-00 [I,C]; C07D0207-36 [I,A]; C07D0207-36 [I,A]; C07D0207-36 [I,A]; C07D0491-00 [I,C]; C07D0491-00 [I,C]; C07D0491-00 [I,C]; C07D0491-00 [I,C]; C07D0491-04 [I,A]; C07D0491-04 [I,A]; C07D0491-056 [I,A]

EPC C07D0207-40D; C07D0207-416; C07D0491-04+321B+209B

ICO M07D0207:40D; M07D0491:04

NCL NCLM 548/453.000  
 NCLS 548/533.000

FCL C07D0207-36; C07D0491-056  
 Main: C07D0491-056  
 Secondary: C07D0207-36

FTRM 4C050; 4C069; 4C050/AA01; 4C069/AC05; 4C069/AC06; 4C069/BB02; 4C050/BB04; 4C069/BB49; 4C069/BC04; 4C069/BD03; 4C069/CC02; 4C050/CC19; 4C050/EE01; 4C050/FF01; 4C050/GG01; 4C050/HH01

AB WO 2007041724 A1 UPAB: 20090403  
 NOVELTY - Composition of matter comprising a N-substituted 3,4-alkylenedioxypyrrole compound (I), is new.  
 DETAILED DESCRIPTION - Composition of matter comprising a N-substituted 3,4-alkylenedioxypyrrole compound of formula (I), is new.  
 R1-R4 = H, CH3, ethyl, 3-20C alkyl, aryl or alkylaryl;  
 Z = H or C(O)OR;  
 R = H, CH3, ethyl, 3-8C alkyl;  
 X = C(O)R5, CH2Y1R6 or CR7=CR8R9;  
 R5 = H, CH3, ethyl, 3-8C alkyl, aryl, OR10 or NR11R12;  
 R10-R12 = H, CH3, ethyl, 3-20C alkyl, aryl or alkylaryl;  
 Y1 = O, OC(O), NR13 or NR14C(O);  
 R6-R9, R13, R14 = H, CH3, ethyl, 3-20C alkyl, aryl or alkylaryl;  
 p = 2-6;  
 m = 1 through p-1; and  
 n = 0 through p-2.  
 INDEPENDENT CLAIMS are also included for:  
 (1) a synthetic intermediate comprising an ester substituted dihydroxypyrrole compound of formula (II); and  
 (2) the preparation of (I).  
 In structure (II),  
 R = CH3, ethyl, 3-20C alkyl or aryl.  
 USE - (I) is useful for the fabrication of a wide variety of products such as electrochromic windows, mirrors and displays, electronic paper, anti-stat conductors, transparent conductors, field effect transistors, supercapacitors, batteries, photovoltaic devices, and other electronic components due to their elevated band gaps, low oxidation potentials, biological activity, and flexibility toward functionalization.

ADVANTAGE - The process of preparing (I) is efficient and cost effective with less toxic reagents and catalysts. (II) is a flexible intermediate with a wide variety of substituents can be formed such that the structure of these monomers and ultimately the polymers from them can be modified to develop properties needed for existing and future uses of the conjugated poly(3,4-alkylenedioxyppyroles).

TECH ORGANIC CHEMISTRY - Preparation (Claimed): Preparation of (I) comprises condensing a nitrogen triester compound of formula  $N(CH_2C(O)OR)_3$  with dimethyl- or diethyl- oxalate into (II), annulating (II) with difunctional alkylene compound of formula  $W_1(CHR_1)_m(CR_2R_3)_n(CHR_4)_p-m-nW_1$  to form ester substituted alkylenedioxyppyrole compound of formula (III), saponifying and neutralizing (III) to form acid substituted 3,4-alkylenedioxy pyrrole compound of formula (IV), decarboxylating (IV) to form 3,4-alkylenedioxyppyrole-acetic acid compound of formula (V), and transforming (V) by a single reaction or a series of reactions into (I) (where Z is H).

$W_1 = Cl, Br, I, \text{ sulfate or sulfonate.}$

Preferred Process: The condensing step comprises a Hinsberg condensation. The annulating step comprises a Williamson etherification, where  $W_1$  is  $Cl, Br, I, \text{ sulfate or sulfonate;}$  and Mitsunobu reaction, where  $W_1$  is  $OH.$  The decarboxylation step comprises thermolysis (where Z is  $C(O)OR$  and R is H) comprising heating at  $140-200^\circ\text{C}.$  The transforming step comprises deprotonation of the 3,4-alkylenedioxyppyrole-acetic acid with a base and condensation with an alkyl halide, alkyl sulfate or alkyl sulfonate to yield (I) (where X is  $C(O)R_5,$   $R_5$  is  $OR_{10},$  and  $R_{10}$  is  $CH_3,$  ethyl or 3-20C alkyl or alkylaryl (preferably benzyl or 2-ethylhexyl)), where the base comprises potassium carbonate and the alkyl halide comprises methyl iodide, benzyl bromide or 1-bromo-2-ethylhexane. The transforming step comprises reduction of 3,4-alkylenedioxyppyrole-acetic acid by the addition of a reducing agent to give (I) (where X is  $CH_2Y_1R_6,$   $Y_1$  is O, and  $R_6$  is  $CH_3,$  ethyl, 3-20C alkyl or alkylaryl) and the reducing agent comprises lithium aluminum hydride.

Preparation of (I) further comprises condensation of the X group via deprotonation of the alcohol by a base and condensation with an alkyl halide or alkyl sulfonate to give (I) (where X is  $CH_2Y_1R_6,$   $Y_1$  is O, and  $R_6$  is  $CH_3,$  ethyl, 3-20C alkyl or alkylaryl (preferably 2-ethylhexyl or benzyl)), where the base comprises sodium hydride and the alkyl halide or alkyl sulfonate comprises methyl iodide, benzyl bromide or 2-ethylhexyl tosylate.

ABEX DEFINITIONS - Preferred Definitions: In structure (I), - R = H or ethyl; -  $R_1-R_4,$  Z = H; - X =  $C(O)R_5$  or  $CH_2Y_1R_6;$  -  $R_5 = OR_{10};$  -  $R_{10} = H, CH_3,$  ethyl, benzyl or 2-ethylhexyl; -  $Y_1 = O;$  and -  $R_6 = H, CH_3,$  benzyl or 2-ethylhexyl. - In structure (II), - R = ethyl.

EXAMPLE - 2-(2,3-Dihydro-(1,4)dioxepino(2,3-c)pyrrol-7(2H)-

yl)ethanol (0.50 g), benzyl bromide (0.56 g), and anhydrous dimethyl formamide (25 ml). The mixture was chilled in an ice bath and then sodium hydride (60% dispersion in mineral oil, 0.22 g) was added. The reaction was stirred for 15 hours, during which the ice bath was allowed to warm to room temperature. The mixture was then poured into deionized water (100 ml), and extracted with ethylene oxide (2x50 ml). The organic layers were combined, washed with brine, dried over sodium sulfate, and concentrated in vacuo. The residue was purified to give 7-(2-benzoyloxy)ethyl-2,3,4,7-tetrahydro-(1,4)dioxepino(2,3-c)pyrrole (0.52 g, 64%).

FS CPI; EPI  
MC CPI: A01-E; E06-E03; E07-D03; E11-A01; E11-F03; E11-F05; E11-G01;  
F05-A06D; L03-G09  
EPI: U11-A01F; U11-A03C; U11-A08B1; U12-A02A; U12-D02; V04-X01B

L97 ANSWER 13 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

AN 2006-241004 [25] WPIX Full-text

DNC C2006-078817 [25]

DNN N2006-206778 [25]

TI Negative electrodes for lithium-ion secondary batteries made by applying inorganic solid electrolyte crystal film manually onto black phosphor, useful in portable electronic equipment e.g. mobile phones

DC L03; X16

IN ZHOU J; CHEN G; ZHANG C

PA (CHEN-I) CHEN G; (ZHAN-I) ZHANG C; (ZHOU-I) ZHOU J

CYC 109

PI WO 2006029561 A1 20060323 (200625)\* ZH 17[5]

CN 1750296 A 20060322 (200649) ZH

ADT WO 2006029561 A1 WO 2005-CN1267 20050816; CN 1750296 A CN 2004-10051493 20040916

PRAI CN 2004-10051493 20040916

IC ICM H01M004-02

ICS H01M004-38

IPCI H01M0010-36 [I,C]; H01M0010-40 [I,A]; H01M0004-02 [I,A]; H01M0004-02 [I,C]; H01M0004-04 [I,A]; H01M0004-04 [I,C]; H01M0004-48 [I,A]; H01M0004-48 [I,C]; H01M0004-58 [I,A]; H01M0004-58 [I,C]

EPC H01M0004-136; H01M0004-58D; H01M0010-0525

AB WO 2006029561 A1 UPAB: 20080920

NOVELTY - A negative electrode for lithium-ion secondary batteries comprises a rhombic black phosphor having orthorhombic structure, with an inorganic solid electrolyte crystal film applied manually onto such black graphite, wherein the film has a thickness of 20-5000 Angstrom together with a lithium ionic conductive substance having an ionic conductivity of not less than  $1 \times 10^{-1}$  S/cm.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:



(1) a method for making the negative electrodes by oxidation of the black phosphor in a solution of strong oxidant, and deposition of a layer of the solid electrolyte crystal film for a lithium-containing compound, in which the oxidant is selected from ammonium persulfate, nitric acid, hydrogen peroxide and sulfuric acid, and the lithium-containing compound including n-butyllithium, tert.-butyllithium, lithium hexafluorophosphate, lithium tetrafluoroborate, lithium citrate, lithium naphthenate and lithium hydroxide; and

(2) lithium-ion secondary **batteries** including the negative electrode arranged with the corresponding positive electrode chosen from lithium cobaltate, lithium nickelate, lithium manganate, lithium cobaltonickelate, lithium nickelomanganate, lithium ferrophosphate and lithium cobaltophosphate, in which main salts in the electrolyte solution are lithium hexafluorophosphate, lithium tetrafluoroborate, lithium hexafluoroarsenate, lithium perchlorate, lithium perfluoroalkanesulfonate or their mixture, and the solvent is composed of methacrylate, dimethyl carbonate, diethyl carbonate, acrylate, methyl ethyl oxalate, methyl propyl carbonate, diepoxyethane, 2-methyltetrafurane or their combination.

USE - The negative electrodes are for lithium-ion secondary **batteries** which are applicable in portable electronic equipment e.g. mobile phones and notebook computers.

ADVANTAGE - Such negative electrodes can be easily made and is an ideal material as graphite substitute. The **batteries** thus made have high capacity. The specific capacity of the negative material obtained is not less than 700 mAh/g.

TECH INORGANIC CHEMISTRY - Preferred Electrodes: The lithium ionic conductive substance is particularly  $\text{Li}_x\text{PO}_y$  where  $2 \leq x \leq 4$  and  $3 \leq y \leq 5$  e.g.  $\text{Li}_3\text{PO}_4$ , or  $\text{Li}_a\text{PO}_b\text{N}_c$  where  $a = 2-4$ ,  $b = 3-5$  and  $c = 0.1-0.9$  e.g.  $\text{Li}_2.9\text{PO}_3.3\text{N}_0.46$ . Preferred Process: Such lithium ionic conductive substance can be  $\text{Li}_x\text{PO}_y$ , e.g.  $\text{LiPO}_4$ .

ABEX EXAMPLE - Black phosphor powder was oxidized, rinsed and heated to dry with the residual water and oxidant to form a little phosphoric acid. Then, a layer of e.g.  $\text{Li}_3\text{PO}_4$  was manually applied to form the negative electrode for fabricating a lithium-ion secondary **battery** for testing

FS CPI; EPI

MC CPI: L03-E01B5; L03-E01B8

EPI: X16-B01F1C; X16-E01C

L97 ANSWER 14 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN  
 AN 1979-55441B [30] WPIX Full-text  
 TI Storage **battery** giving constant discharge voltage for long periods - has an electrolyte of organic solvent, e.g. propylene carbonate, and an inorganic salt solute, e.g. lithium chlorate  
 DC A85; E17; L03; X16

PA (HITB-C) HITACHI CHEM CO LTD; (HITA-C) HITACHI LTD

CYC 1

PI JP 54075535 A 19790616 (197930)\* JA

ADT JP 54075535 A JP 1977-142765 19771130

PRAI JP 1977-142765 19771130

IPCR H01M0004-50 [I,A]; H01M0004-50 [I,C]

FCL H01M0004-50; H01M0004-50 101

FTRM 5H003; 5H050; 5H003/AA01; 5H050/AA02; 5H003/BA03; 5H003/BA01;

5H050/BA06; 5H003/BB04; 5H003/BB12; 5H003/BC06; 5H050/CA05;

5H050/CB12; 5H050/EA09; 5H050/EA24; 5H050/GA00; 5H050/GA27

AB JP 54075535 A UPAB: 20050419

The storage **battery** comprises a positive electrode, a non-aqueous organic electrolyte and a negative electrode of light metal, such as Li or Na. The electrolyte consists of an organic solvent and a solute of inorganic salt, such as LiClO<sub>4</sub>. The solvent is propylene carbonate and/or dicarboxylic acid diester, such as dimethyl oxalate, **diethyl oxalate**, **dimethyl malonate**, diethyl malonate, dimethyl succinate, diethyl succinate or diethyl glutarate. The positive electrode consists of MnO<sub>2</sub> which has been irradiated by microwaves of wavelength 1 - 20 cm in the organic solvent.

The storage **battery** has an improved positive electrode and can give a constant discharge voltage for periods >100 hrs.. The positive electrode further contains a conducting agent of graphite and a binder of PTFE.

FS CPI; EPI

MC CPI: A12-E06; E35-S; L03-E01B; L03-E01C

L97 ANSWER 15 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

AN 1979-55440B [30] WPIX Full-text

TI Organic electrolytic storage **battery** with improved positive electrode - comprises a manganese di:oxide-silver oxide and/or copper oxide positive electrode, an organic electrolyte and a light metal electrode

DC A85; E17; L03; X16

PA (HITB-C) HITACHI CHEM CO LTD; (HITA-C) HITACHI LTD

CYC 1

PI JP 54075534 A 19790616 (197930)\* JA

ADT JP 54075534 A JP 1977-142764 19771130

PRAI JP 1977-142764 19771130

IPCR H01M0004-50 [I,A]; H01M0004-50 [I,C]

FCL H01M0004-50; H01M0004-50 101

FTRM 5H003; 5H050; 5H003/AA01; 5H050/AA02; 5H003/BA03; 5H050/BA06;

5H003/BB04; 5H050/CA02; 5H050/CA05; 5H050/CB12; 5H050/EA09;

5H050/EA24

AB JP 54075534 A UPAB: 20050419

**Battery** comprises a positive electrode, a non-aqueous organic electrolyte and a negative electrode of light metal, such as Li or

Na. The electrolyte consists of an organic solvent and a solute of inorganic salt, such as LiClO<sub>4</sub>. The solvent is propylene carbonate and/or dicarboxylic acid diester, such as dimethyl oxalate, diethyl oxalate, dimethyl malonate, diethyl malonate, dimethyl succinate, diethyl succinate or diethyl glutarate. The positive electrode consists of 50 - 90 weight% of MnO<sub>2</sub> and 10 - 50 weight% of Ag oxide and/or Cu oxide. The storage battery with the improved positive electrode maintains a constant discharge voltage for >100 hours. The positive electrode further contains a conductive agent of graphite and a binder of PTFE.

FS CPI; EPI

MC CPI: A12-E06; E35-A; E35-B; E35-S; L03-E01B; L03-E01C

L97 ANSWER 16 OF 41 WPIX COPYRIGHT 2009 THOMSON REUTERS on STN

AN 1976-36829X [20] WPIX Full-text

TI Porous beryllium anode **battery** of stable voltage - with sulphide cathode and organic electrolyte

DC L03; X16

PA (CITL-C) CITIZEN WATCH CO LTD

CYC 1

PI JP 51038029 A 19760330 (197620)\* JA

ADT JP 51038029 A JP 1974-111088 19740927; JP 51038029 A JP 1974-129762 19741111

PRAI JP 1974-129762 19741111

JP 1974-111088 19740927

IPCR H01M0004-38 [I,A]; H01M0004-38 [I,C]; H01M0006-16 [I,A]; H01M0006-16 [I,C]

FCL H01M0004-38

FTRM 5H003; 5H016; 5H050; 5H016/AA01; 5H050/AA02; 5H016/AA08; 5H050/AA08; 5H050/BA06; 5H050/CA11; 5H050/CB11; 5H050/EA09; 5H050/EA11; 5H016/EE01; 5H016/EE04; 5H016/EE08

AB JP 51038029 A UPAB: 20050415

Beryllium **battery** capable of being used for a long period without change in voltage, uses sulphide as cathode metallic beryllium as anode, and an organic electrolyte chosen from propylene carbonate, furfural or diethyl oxalate. The anode of metallic beryllium is made by compacting flake-like beryllium material and has a porosity of 42%.

FS CPI; EPI

MC CPI: L03-E01B

=> d 197 17-41 bib abs hitind

YOU HAVE REQUESTED DATA FROM FILE 'JAPIO, ENERGY, WPIX, HCAPLUS' - CONTINU  
E? (Y)/N:y

L97 ANSWER 17 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2009:656332 HCAPLUS Full-text  
 DN 151:207310  
 TI Comparative study of Fe<sup>2+</sup>/H<sub>2</sub>O<sub>2</sub> and Fe<sup>3+</sup>/H<sub>2</sub>O<sub>2</sub> electro-oxidation systems in the degradation of amaranth using anthraquinone/polypyrrole composite film modified graphite cathode  
 AU Zhang, Guoquan; Yang, Fenglin; Liu, Lifan  
 CS Key Laboratory of Industrial Ecology and Environmental Engineering, Ministry of Education, School of Environmental and Biological Science and Technology, Dalian University of Technology, Dalian, 116024, Peop. Rep. China  
 SO Journal of Electroanalytical Chemistry (2009), 632(1-2), 154-161  
 CODEN: JECHES  
 PB Elsevier B.V.  
 DT Journal  
 LA English  
 AB Removal of amaranth from aqueous solns. by Fe<sup>2+</sup>/H<sub>2</sub>O<sub>2</sub> and Fe<sup>3+</sup>/H<sub>2</sub>O<sub>2</sub> electrooxidn. systems was comparatively studied in an undivided electrochem. cell with anthraquinonedisulfonate (AQDS)/polypyrrole (PPy) composite film modified graphite as cathode. The modified cathode gave strong oxidant hydroxyl radical (•OH) in the medium via Fenton's reaction between cathodically generated H<sub>2</sub>O<sub>2</sub> and added or regenerated Fe<sup>2+</sup>. The effects of solution pH and Fe catalyst concentration on dye degradation by the 2 systems were studied and compared. Degradation intermediates were analyzed by FTIR and GC-MS, and a tentative reaction pathway is proposed. Dye decay reaction always obeys pseudo-first-order kinetics for Fe<sup>3+</sup>/H<sub>2</sub>O<sub>2</sub> process, while dye degradation follows a 2-stage process with each stage obeying pseudo-first-order kinetics in the case of Fe<sup>2+</sup>/H<sub>2</sub>O<sub>2</sub> system. The long-term stability and structural relaxation of the composite film during multiple exptl. runs are also examined  
 CC 72-2 (Electrochemistry)  
 Section cross-reference(s): 22, 41, 60  
 IT 50-21-5, Lactic acid, properties 79-20-9 85-44-9, Phthalic anhydride 108-59-8, Malonic acid, dimethyl ester 119-67-5 127-17-3, Pyruvic acid, properties 524-42-5, 1,2-Naphthalenedione 553-90-2, Oxalic acid, dimethyl ester 574-00-5, 1,2-Dihydroxynaphthalene  
 RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)  
 (intermediate in amaranth degradation; comparative study of Fe<sup>2+</sup>/H<sub>2</sub>O<sub>2</sub> and Fe<sup>3+</sup>/H<sub>2</sub>O<sub>2</sub> electrooxidn. systems in degradation of amaranth using anthraquinonedisulfonate/polypyrrole composite film modified

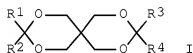
graphite cathode)

RE.CNT 36 THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 18 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
AN 2007:1116646 HCAPLUS Full-text  
DN 147:430251  
TI Nonaqueous electrolyte solution and secondary nonaqueous electrolyte  
battery  
IN Kotado, Minoru; Sakata, Yuichi; Kinoshita, Shinichi  
PA Mitsubishi Chemical Corp., Japan  
SO Jpn. Kokai Tokkyo Koho, 23pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007258103	A	20071004	JP 2006-83877	20060324
JP 2006-83877		20060324		

OS MARPAT 147:430251  
GI



AB The electrolyte solution has an electrolyte salt dissolved in a nonaq. solvent; where the electrolyte solution comprises  $\geq 1$  1st compound, selected from cyclic anhydrides, cyclic sulfonic esters, dialkenyl dicarboxylate, compound I [R1-4 = H, (F substituted) C1-12 alkyl group, or (F substituted) alkenyl group], and a boron-containing Li salt, and a dialkyl dicarboxylate. The battery has a Li-intercalating cathode, a Li-intercalating anode, and the above electrolyte solution

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte dialkyl dicarboxylate

IT Battery electrolytes

(electrolyte solns. containing dialkyl dicarboxylates for secondary lithium batteries)

IT Secondary batteries  
(lithium; electrolyte solns. containing dialkyl dicarboxylates for secondary lithium batteries)

IT 78-19-3, 3,9-Divinyl-2,4,8,10-tetraoxaspiro[5,5]undecane 108-31-6, Maleic anhydride, uses 108-59-8, Dimethyl malonate 624-48-6, Dimethyl maleate 624-49-7, Dimethyl fumarate 872-36-6, Vinylene carbonate 925-16-6, Diallyl succinate 1120-71-4, Propane sultone 14283-07-9, Lithium tetrafluoroborate 244761-29-3  
RL: MOA (Modifier or additive use); USES (Uses)  
(electrolyte solns. containing dialkyl dicarboxylates for secondary lithium batteries)

IT 96-49-1, Ethylene carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 7782-42-5, Graphite, uses 12190-79-3, Cobalt lithium oxide (CoLiO2) 21324-40-3, Lithium hexafluorophosphate  
RL: TEM (Technical or engineered material use); USES (Uses)  
(electrolyte solns. containing dialkyl dicarboxylates for secondary lithium batteries)

L97 ANSWER 19 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
AN 2006:176300 HCAPLUS Full-text  
DN 145:338956  
TI Film formation in lithium bis(oxalato)borate-containing electrolytes  
AU Panitz, Jan-Christoph; Wietelmann, Ulrich; Wachtler, Mario; Stroebele, Sandra; Wohlfahrt-Mehrens, Margret  
CS Chemetall GmbH, Frankfurt am Main, D-60487, Germany  
SO Journal of Power Sources (2006), 153(2), 396-401  
CODEN: JPSODZ; ISSN: 0378-7753  
PB Elsevier B.V.  
DT Journal  
LA English  
AB Lithium bis(oxalato)borate (LiBOB), a new electrolyte salt for lithium batteries, is actively involved in the formation of the solid electrolyte interphase (SEI) at the anode. Part of this formation is an irreversible reductive reaction taking place at potentials of around 1.75 V vs. Li/Li+ and contributing to the irreversible capacity of anode materials in the first cycle. Cyclic voltammetry has been performed on several carbon materials as well as on Li4Ti5O12 and pre-treated glassy carbon electrodes in order to achieve a better understanding of the underlying processes. It is found that the intensity of the 1.75 V peak depends on the BET sp.

surface area and the surface chemical of the active material and increases with the amount of oxygen-containing surface functionalities. It is not specific to carbonaceous materials but is also observed on carbon-free anodes like Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub>. In addition, the effect of several potential impurities and of film-forming additives on the filming behavior of LiBOB-containing electrolytes has been investigated.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium oxalatoborate film formation graphite electrolyte impurity;  
 conducting salt lithium oxalatoborate lithium ion battery  
 IT Battery anodes  
     Battery electrolytes  
     Cyclic voltammetry  
       (film formation in lithium bis(oxalato)borate-containing  
       electrolytes)  
 IT Secondary batteries  
     (lithium; film formation in lithium bis(oxalato)borate-containing  
     electrolytes)  
 IT 95-92-1, Diethyl oxalate 121-43-7 7732-18-5,  
     Water, miscellaneous  
     RL: MSC (Miscellaneous)  
       (testing of, as electrolyte impurity; film formation in lithium  
       bis(oxalato)borate-containing electrolytes)  
 OSC.G 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5  
         CITINGS)  
 RE.CNT 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD  
         ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 20 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2005:732891 HCAPLUS Full-text  
 DN 143:214335  
 TI Nonaqueous electrolyte solution, secondary lithium battery  
     , and operation of the battery  
 IN Abe, Koji  
 PA Ube Industries, Ltd., Japan  
 SO PCT Int. Appl., 23 pp.  
     CODEN: PIXXD2  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	WO 2005074067	A1	20050811	WO 2005-JP1424	

200502  
01

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA,

CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP,  
 KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
 MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD,  
 SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ,  
 VC, VN, YU, ZA, ZM, ZW  
 RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW,  
 AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ,  
 DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC,  
 NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA,  
 GN, GQ, GW, ML, MR, NE, SN, TD, TG

CA 2555192	A1	20050811	CA 2005-2555192	20050201
CN 1938894	A	20070328	CN 2005-80010139	20050201
US 20070148554	A1	20070628	US 2006-588063	20060801
KR 2006129042	A	20061214	KR 2006-717663	20060831
IN 2006CN03177	A	20070608	IN 2006-CN3177	20060901

PRAI JP 2004-25834 A 20040202  
 WO 2005-JP1424 W 20050201

# ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The electrolyte solution has an electrolyte dissolved in a nonaq. solvent and contains 1-10% cyclohexylbenzene derivative with halogenated benzene rings and 0.1-5% fluorobenzene derivative. The battery uses the above electrolyte solution containing several cyclic carbonates as electrolyte solution. The battery is operated with a maximum operational voltage  $\geq 4.2$  V.

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST secondary lithium battery electrolyte halogenated

cyclohexylbenzene fluorobenzene deriv

IT Battery electrolytes

(electrolyte solns. containing halogenated cyclohexylbenzene and fluorobenzene derivs. for secondary lithium batteries)

IT Secondary batteries

(lithium; secondary lithium batteries with electrolyte solns. containing halogenated cyclohexylbenzene and fluorobenzene derivs. and their operation method)

IT 96-49-1, Ethylene carbonate 615-52-1 623-53-0, Methyl



ethyl carbonate 872-36-6, Vinylene carbonate 1120-71-4,  
 1,3-Propanesultone 21324-40-3, Lithium hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing halogenated cyclohexylbenzene and  
 fluorobenzene derivs. for secondary lithium **batteries**)  
 IT 452-10-8, 2,4-Difluoroanisole 462-06-6, Fluorobenzene 1717-84-6  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte solns. containing halogenated cyclohexylbenzene and  
 fluorobenzene derivs. for secondary lithium **batteries**)  
 OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2  
 CITINGS)  
 RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 21 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2004:159942 HCAPLUS Full-text

DN 140:184762

TI Secondary **battery** and method for preventing overcharging

IN Shizuka, Kenji; Shima, Kunihi

PA Mitsubishi Chemical Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 12 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2004063233	A	20040226	JP 2002-219124	200207 29

PRAI JP 2002-219124 20020729

OS MARPAT 140:184762

AB The **battery** is equipped with an electrolyte containing an overcharging-preventing agent which generates a solid salt under overcharging condition. Preferably, the agent contains a dicarboxylate ester. Optionally, the **battery** contains a trigger substance, e.g., an aromatic compound, which is oxidized under overcharging condition and the oxidized substance accelerates reaction of the solid salt formation. The **battery**, especially secondary Li **battery**, provides high safety.

IC ICM H01M010-34

ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST overcharging prevention carboxylate ester secondary **battery**

electrolyte safety

IT Carboxylic acids, uses

- RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (dicarboxylic, esters; secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- IT Secondary **batteries**  
 (lithium; secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- IT **Battery** electrolytes  
 Safety  
 (secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- IT Aromatic compounds  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (trigger substance; secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solvent; secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- IT 21324-40-3, Lithium hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte; secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- IT 95-92-1, **Diethyl oxalate**  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- IT 132-64-9, Dibenzofuran  
 RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
 (trigger substance; secondary **battery** with electrolyte containing dicarboxylate ester for preventing overcharging)
- L97 ANSWER 22 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2003:317640 HCAPLUS Full-text  
 DN 138:324047  
 TI Liquid-crystalline polysiloxanes and their uses in electrolyte compositions for (photo)**electrochemical cells** and secondary nonaqueous **batteries**  
 IN Yasuda, Takayasu; Wariishi, Koji  
 PA Fuji Photo Film Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 33 pp.  
 CODEN: JKXXAF

DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	JP 2003123531	A	20030425	JP 2001-322124	20011019
PRAI	JP 2001-322124		20011019		
AB	<p>The electrolyte compns. contain liquid-crystalline polysiloxanes having repeating units [O(SiR1R2O)nL1XL2] (R1, R2 = alkyl, alkoxy; L1, L2 = divalent linking group, single bond; X = mesogen; R1, R2, L1, L2, and/or X has ionic substituent; n ≥ 1) and are used in electrochem. cells, charge-transporting layers in photoelectrochem. cells, and secondary nonaq. batteries. Liquid-crystalline polysiloxanes having repeating units [O(SiR1R2O)nL1(Q1YQ2)n'L2] (R1, R2 = alkyl, alkoxy; L1, L2 = C1-24 alkylene, alkyleneoxy, single bond; Q1, Q2 = divalent linking group, single bond; Y = divalent 4-7 membered ring, its condensed ring; R1, R2, L1, L2, and/or Y has ionic substituent; n ≥ 1; n' = 1-3) are also claimed. The cells and the batteries using the compns. have high durability, photoelec. conversion characteristics, cycle performance, etc.</p>				
IC	<p>ICM H01B001-06 ICS C08G077-48; H01M006-18; H01M010-40; H01M014-00</p>				
CC	<p>52-2 (Electrochemical, Radiational, and Thermal Energy Technology) Section cross-reference(s): 38, 75, 76</p>				
ST	<p>electrochem cell liq crystal polysiloxane electrolyte; photoelectrochem cell liq crystal polysiloxane electrolyte; nonaq battery liq crystal polysiloxane electrolyte</p>				
IT	<p>Battery electrolytes Electrochemical cells Liquid crystals, polymeric Photoelectrochemical cells Polyelectrolytes (liquid-crystalline polysiloxanes with ionic groups in electrolyte compns. for (photo)electrochem. cells and secondary nonaq. batteries)</p>				
IT	<p>Polysiloxanes, uses RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (liquid-crystalline polysiloxanes with ionic groups in electrolyte compns. for (photo)electrochem. cells and secondary nonaq. batteries)</p>				
IT	<p>Secondary batteries</p>				

(lithium; liquid-crystalline polysiloxanes with ionic groups in electrolyte comps. for (photo)electrochem. cells and secondary nonaq. batteries)

IT 512773-47-6P  
 RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (liquid-crystalline polysiloxanes with ionic groups in electrolyte comps. for (photo)electrochem. cells and secondary nonaq. batteries)

IT 512773-51-2 512773-53-4 512773-56-7 512773-58-9 512773-70-5  
 512773-73-8 512773-77-2 512773-92-1  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (liquid-crystalline polysiloxanes with ionic groups in electrolyte comps. for (photo)electrochem. cells and secondary nonaq. batteries)

IT 350507-46-9P 512774-00-4P 512774-03-7P 512774-08-2P  
 512774-14-0P  
 RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
 (liquid-crystalline polysiloxanes with ionic groups in electrolyte comps. for (photo)electrochem. cells and secondary nonaq. batteries)

IT 108-59-8, Dimethyl malonate 627-32-7  
 872-85-5, 4-Pyridinecarboxaldehyde 4667-38-3,  
 Dichlorodiethoxysilane 88088-72-6  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (liquid-crystalline polysiloxanes with ionic groups in electrolyte comps. for (photo)electrochem. cells and secondary nonaq. batteries)

L97 ANSWER 23 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2003:167055 HCAPLUS Full-text  
 DN 138:207820  
 TI Electrolyte compositions and their use in electrochemical cells, photoelectrochemical cells, and secondary nonaqueous batteries  
 IN Yasuda, Takayasu; Wariishi, Koji  
 PA Fuji Photo Film Co., Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 30 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 2003064259

A

20030305

JP 2001-256050

200108  
27

PRAI JP 2001-256050

20010827

- AB The comps. comprise polysiloxanes having repeating units Si(OR1)(OR2)O (R1, R2 = alkyl, alkyleneoxy) and liquid-crystalline ionic compds., e.g., compds. having mesogen-containing anions and (in)organic cations. The photoelectrochem. cells have charge-transporting layers containing the electrolyte compns., dye-sensitized semiconductor-containing photosensitive layers, and electrodes on conductive supports. The nonvolatile compns. have high durability, ion conductivity, and charge-transporting property and give the cells and the batteries with good cycle performance, photoelec. conversion, etc.
- IC ICM C08L083-06  
ICS C08K005-00; C08L101-12; H01B001-06; H01M006-18; H01M010-40; H01M014-00
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38, 75
- ST photoelectrochem cell electrolyte polysiloxane liq cryst ionic compd; battery electrolyte polysiloxane liq cryst ionic compd
- IT Battery electrolytes  
Electrochemical cells  
Liquid crystals  
Liquid crystals, polymeric  
Photoelectrochemical cells  
(electrolyte compns. containing polysiloxanes and liquid-crystalline ionic compds. for (photo)electrochem. cells and secondary nonaq. batteries)
- IT Polysiloxanes, uses  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(electrolyte compns. containing polysiloxanes and liquid-crystalline ionic compds. for (photo)electrochem. cells and secondary nonaq. batteries)
- IT Secondary batteries  
(lithium; electrolyte compns. containing polysiloxanes and liquid-crystalline ionic compds. for (photo)electrochem. cells and secondary nonaq. batteries)
- IT 500163-09-7P  
RL: DEV (Device component use); IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(electrolyte compns. containing polysiloxanes and liquid-crystalline ionic

compds. for (photo)electrochem. cells and secondary nonaq. batteries)

IT 180027-63-8 189282-51-7 189282-53-9, Poly[oxy(diethoxysilylene)]  
444025-85-8, Poly[oxy(dimethoxysilylene)] 500163-11-1  
500163-14-4 500163-16-6 500163-18-8 500163-19-9 500163-21-3  
500163-22-4 500163-24-6 500163-26-8 500163-30-4 500163-32-6  
500163-33-7

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(electrolyte compns. containing polysiloxanes and liquid-crystalline ionic

compds. for (photo)electrochem. cells and secondary nonaq. batteries)

IT 85689-41-4P 139475-37-9P 202813-37-4P

RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)

(electrolyte compns. containing polysiloxanes and liquid-crystalline ionic

compds. for (photo)electrochem. cells and secondary nonaq. batteries)

IT 108-59-8, Dimethyl malonate  
112-29-8, 1-Bromodecane 638-45-9 872-85-5,  
4-Pyridinecarboxaldehyde

RL: RCT (Reactant); RACT (Reactant or reagent)

(electrolyte compns. containing polysiloxanes and liquid-crystalline ionic

compds. for (photo)electrochem. cells and secondary nonaq. batteries)

L97 ANSWER 24 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2002:941829 HCAPLUS Full-text

DN 138:6489

TI Fuel cell with proton conducting membrane

IN Peled, Emanuel; Duvdevani, Tair; Melman, Avi; Aharon, Adi

PA Ramot University Authority for Applied Research & Industrial Development Ltd., Israel

SO U.S., 21 pp., Cont. of U.S. Ser. No. 484,267.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 4

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI US 6492047

B1

20021210

US 2000-604297

				200006 26
US 6447943	B1	20020910	US 2000-484267	200001 18
CA 2397536	A1	20010726	CA 2001-2397536	200101 18
CA 2397568	A1	20010726	CA 2001-2397568	200101 18
WO 2001054220	A2	20010726	WO 2001-IL54	200101 18
WO 2001054220	A3	20020808		200101 18
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
WO 2001054216	A2	20010726	WO 2001-IL55	200101 18
WO 2001054216	A3	20020221		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
AU 2001027021	A	20010731	AU 2001-27021	200101 18
AU 2001027022	A	20010731	AU 2001-27022	200101 18
EP 1249052	A2	20021016	EP 2001-901354	200101

18

EP 1249052 B1 20090422

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

EP 1249053 A2 20021016 EP 2001-901355

200101  
18

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

JP 2003520412 T 20030702 JP 2001-553606

200101  
18

JP 2003520413 T 20030702 JP 2001-553610

200101  
18

RU 2262161 C2 20051010 RU 2002-122086

200101  
18

IL 150645 A 20060410 IL 2001-150645

200101  
18

CN 1255894 C 20060510 CN 2001-804609

200101  
18

IL 169049 A 20080120 IL 2001-169049

200101  
18

IL 150648 A 20081103 IL 2001-150648

200101  
18

AT 429717 T 20090515 AT 2001-901354

200101  
18

PRAI US 2000-484267 A2 20000118

US 2000-604297 A 20000626

IL 2001-150645 A3 20010118

WO 2001-IL54 W 20010118

WO 2001-IL55 W 20010118

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present invention provides improved, low-cost fuel cells having reduced fuel crossover, reduced sensitivity to metal ion impurities and ability to operate under a broad range of temps. Addnl., new effective organic fuels are described for use in such fuel cells. The invention further provides improved methods for catalyst preparation and a new integrated flow field system for use in H<sub>2</sub>/O<sub>2</sub> fuel cells.

IC ICM H01M008-10



INCL 429030000; 429033000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 IT Secondary **batteries**  
 (lithium, hybrid power source; fuel cell with proton conducting membrane)  
 IT 56-81-5, Glycerol, uses 107-21-1, Ethylene glycol, uses 107-22-2, Glyoxal aldehyde 144-62-7, Oxalic acid, uses 298-12-4, Glyoxalic acid 553-90-2, Dimethyl oxalate 922-68-9 9002-84-0, Teflon  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (fuel cell with proton conducting membrane)  
 OSC.G 13 THERE ARE 13 CAPLUS RECORDS THAT CITE THIS RECORD (13 CITINGS)  
 RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 25 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2002:962382 HCAPLUS Full-text

DN 138:58890

TI Electrolyte and secondary **battery**

IN Shizuka, Kenji; Okahara, Kenji; Shima, Kunihi

PA Mitsubishi Chemical Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 2002367674	A	20021220	JP 2001-175182	20010611

PRAI JP 2001-175182 20010611

OS MARPAT 138:58890

AB The electrolyte solution has a Li salt dissolved in a solvent mixture containing  $\geq 1$  nonaq. solvent selected from carbonate esters, ethers and/or lactones; a dicarboxylate diester of the formula  $R1O2(CH2)nO2R2$  or  $R3O2(CH2)pCH(CH2)qO2R4$  (excluding succinate diesters) [ $R1-R4 = C1-10$  alkyl or halogen substituted alkyl;  $n =$  an integer from 0-1 and 3-10;  $p$  and  $q =$  an integer from 0-5; and  $0 \leq (p+q) \leq 10$ ], or a derivative thereof; and an aromatic compound of the formula  $C6R1R2R3R4R5R6$  or  $R1OC6R2R3R4R5R6$  [ $R1-R6 = H$ , halogen,  $C1-10$  chain alkyl,  $C4-10$  cyclic alkyl, or (substituted) phenyl], having mol. weight  $\leq 500$ . The **battery** has the above electrolyte solution, a cathode containing a Li transition metal oxide, and a carbonaceous anode.

IC ICM H01M010-40  
 ICS H01M004-02; H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium battery electrolyte nonaq solvent additive  
 dicarboxylate diester  
 IT Battery electrolytes  
 (electrolyte solns. containing dicarboxylate diesters and aromatic  
 compds. with controlled mol. weight for secondary lithium  
 batteries)  
 IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
 21324-40-3, Lithium hexafluorophosphate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing dicarboxylate diesters and aromatic  
 compds. with controlled mol. weight for secondary lithium  
 batteries)  
 IT 95-92-1, Diethyl oxalate 108-59-8,  
 Dimethyl malonate 132-64-9, Dibenzofuran  
 872-36-6, Vinylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (electrolyte solns. containing dicarboxylate diesters and aromatic  
 compds. with controlled mol. weight for secondary lithium  
 batteries)  
 OSC.G 2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2  
 CITINGS)

L97 ANSWER 26 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2001:546027 HCAPLUS Full-text  
 DN 135:109743  
 TI Fuel cell with proton conducting membrane  
 IN Peled, Emanuel; Duvdevani, Tair; Melman, Avi; Aharon, Adi  
 PA Ramot University Authority for Applied Research and Industrial  
 Development Ltd., Israel  
 SO PCT Int. Appl., 48 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 FAN.CNT 4

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI WO 2001054216	A2	20010726	WO 2001-IL55	20010118
WO 2001054216	A3	20020221		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,				

LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ,  
 PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ,  
 UA, UG, US, UZ, VN, YU, ZA, ZW  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,  
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE,  
 TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD,  
 TG

US 6447943	B1	20020910	US 2000-484267	20000118
US 6492047	B1	20021210	US 2000-604297	20000626
CA 2397536	A1	20010726	CA 2001-2397536	20010118
AU 2001027022	A	20010731	AU 2001-27022	20010118
EP 1249053	A2	20021016	EP 2001-901355	20010118
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2003520412	T	20030702	JP 2001-553606	20010118
IL 150645	A	20060410	IL 2001-150645	20010118
IL 169049	A	20080120	IL 2001-169049	20010118
US 7413824	B2	20080819	US 2002-181061	20021015
US 20030091883	A1	20030515		
US 20080241629	A1	20081002	US 2008-81362	20080415
PRAI US 2000-484267	A	20000118		
US 2000-604297	A	20000626		
IL 2001-150645	A3	20010118		
WO 2001-IL55	W	20010118		
US 2002-181061	A3	20021015		

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

AB The present invention provides improved, low-cost fuel cells having reduced fuel crossover, reduced sensitivity to metal ion impurities and ability to operate under a broad range of temps. The invention further provides improved methods for catalyst preparation and a new integrated flow field system for use in H2/O2 fuel cells.

IC ICM H01M008-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 38

IT Secondary batteries

(lithium; fuel cell with proton conducting membrane)

IT 50-00-0, Formaldehyde, uses 56-81-5, Glycerol, uses 64-18-6, Formic acid, uses 67-56-1, Methanol, uses 107-21-1, Ethylene glycol, uses 107-31-3, Methyl formate 109-94-4, Ethyl formate 144-62-7, Oxalic acid, uses 553-90-2, Dimethyl oxalate 1303-86-2, boron oxide b2o3, uses 1314-23-4, Zirconia, uses 1344-28-1, Alumina, uses 7440-22-4, Silver, uses 7782-42-5, Graphite, uses 10043-35-3, Boric acid (H3BO3), uses 12604-59-0, Hastelloy C-276 12651-23-9, Titanium hydroxide 12688-15-2, Zirconium hydroxide 12713-25-6, Zirconium hydroxide oxide 12738-89-5, Titanium hydroxide oxide 13463-67-7, Titania, uses 21645-51-2, Aluminum hydroxide, uses 24623-77-6, Aluminum hydroxide oxide

RL: TEM (Technical or engineered material use); USES (Uses)  
(fuel cell with proton conducting membrane)

OSC.G 9 THERE ARE 9 CAPLUS RECORDS THAT CITE THIS RECORD (9 CITINGS)

RE.CNT 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 27 OF 41 HCAPLUS COPYRIGHT 2009 ACS on SIN

AN 2001:524704 HCAPLUS Full-text

DN 135:114408

TI Photoelectrochemical cell comprising polymer electrolyte composition formed by polymerizing ionic liquid crystal monomer

IN Ono, Michio

PA Fuji Photo Film Co., Ltd., Japan

SO Eur. Pat. Appl., 43 pp.

CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	EP 1116769	A2	20010718	EP 2001-100999	

200101  
17

EP 1116769 A3 20090211  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC,  
 PT, IE, SI, LT, LV, FI, RO, CY, TR, AL, MK  
 JP 2001202995 A 20010727 JP 2000-8054

200001  
 17

US 20020034690 A1 20020321 US 2001-759363

200101  
 16

US 6727023 B2 20040427

PRAI JP 2000-8054 A 20000117

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OS MARPAT 135:114408

AB Disclosed is an electrolyte composition comprising a polymer compound formed by polymerizing an ionic liquid crystal monomer containing at least one polymerizable group. Also disclosed are an electrochem. cell, a nonaq. secondary cell and a photoelectrochem. cell, each comprising the electrolyte composition. In accordance with the present invention, an electrolyte which does not substantially volatilize and exhibits excellent charge-transporting properties can be obtained, making it possible to obtain a photoelectrochem. cell having excellent photoelec. conversion properties and less deterioration of properties with time. Further, a lithium ion-conducting material having an extremely high ionic conductivity at low temps. can be obtained.

IC ICM C09K019-00

ICS C09K019-38; H01G009-20

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

Section cross-reference(s): 72

IT 98-59-9, p-Toluenesulfonyl chloride 104-15-4, reactions

108-59-8, Dimethyl malonate 112-29-8,

1-Bromodecane 629-11-8, Hexamethylene glycol 814-68-6,

2-Propenoyl chloride 872-85-5, Pyridine-4-aldehyde 1122-58-3

2615-15-8, Hexaethylene glycol 3943-97-3 7681-82-5, Sodium

iodide, reactions 10041-02-8 14104-20-2, Silver

tetrafluoroborate 53463-68-6, 10-Bromodecanol 90076-65-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(in preparation of ionic liquid crystal monomer containing polymerizable group)

OSC.G 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (7 CITINGS)

L97 ANSWER 28 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2001:252605 HCAPLUS Full-text

DN 135:35148

TI New fuels as alternatives to methanol for direct oxidation fuel cells

AU Peled, E.; Duvdevani, T.; Aharon, A.; Melman, A.

CS School of Chemistry, Tel Aviv University, Tel Aviv-Jaffa, 69978, Israel

SO Electrochemical and Solid-State Letters (2001), 4(4), A38-A41  
CODEN: ESLEF6; ISSN: 1099-0062

PB Electrochemical Society

DT Journal

LA English

AB Hydrocarbons and aliphatic alcs. are difficult to electro-oxidize. Even at 190°C the oxidation of ethanol is incomplete (less than 40% CO<sub>2</sub>). We report here, for the first time, on the complete electro-oxidation of two mols. having C-C bonds; ethylene glycol (EG) and di-Me oxalate (DMO). Both are less prone to pass through the membrane, and, as a result, have up to 94-95% fuel utilization, 9-10% higher than that of methanol. EG is well known in the automobile industry and, in contrast to methanol, its distribution infrastructure already exists, making it a promising candidate for practical elec. vehicles. DMO is a solid that has limited solubility in water, thus it may be added directly to the anode compartment with no need of a sep. fuel tank and monitoring and feeding systems. It is projected that a flat di-Me oxalate fuel cell will deliver up to 600 Wh/kg, five to ten times the specific energy of the lithium-ion battery in small portable devices. However, methanol does have some advantages over EG and DMO, its theor. capacity is 20 to 40% higher and so far it has higher energy conversion efficiency.

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 72

IT 107-21-1, Ethylene glycol, uses 553-90-2, Dimethyl oxalate  
RL: NUU (Other use, unclassified); USES (Uses)  
(fuel alternatives to methanol for direct oxidation fuel cells)

OSC.G 47 THERE ARE 47 CAPLUS RECORDS THAT CITE THIS RECORD (47 CITINGS)

RE.CNT 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 29 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2000:15558 HCAPLUS Full-text

DN 132:52434

TI Solvent for electrolytic solutions for lithium ion batteries

IN Chang, Hao

PA Duracell Inc., USA

SO PCT Int. Appl., 14 pp.  
CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	WO 2000001027	A1	20000106	WO 1999-US13110	199906 10
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW				
	RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	US 6045950	A	20000404	US 1998-105510	199806 26
	AU 9944335	A	20000117	AU 1999-44335	199906 10
	TW 456064	B	20010921	TW 1999-88109730	199906 10
PRAI	US 1998-105510	A	19980626		
	WO 1999-US13110	W	19990610		
ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT					
AB	Electrolytic solns. containing a malonate ester having no alpha-carbon hydrogen atoms are disclosed. The malonate ester is selected from the group consisting of di-Et di-Me malonate, di-Et di-Et malonate, di-Me di-Et malonate, and di-Me di-Me malonate. The electrolytic solns. can be used in lithium ion batteries.				
IC	ICM H01M010-40				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)				
ST	lithium battery electrolyte malonate ester				
IT	Esters, uses				
	RL: DEV (Device component use); USES (Uses)				
	(chain; solvent for electrolytic solns. for lithium ion batteries)				
IT	Secondary batteries				
	(lithium; solvent for electrolytic solns. for lithium ion batteries)				
IT	Battery electrolytes				
	(solvent for electrolytic solns. for lithium ion batteries)				
IT	Ethers, uses				

Lactones

Phosphates, uses

RL: DEV (Device component use); USES (Uses)

(solvent for electrolytic solns. for lithium ion  
batteries)

IT 60-29-7, Diethyl ether, uses 77-25-8, Diethyl diethyl malonate  
 78-40-0, Triethyl phosphate 96-48-0,  $\gamma$ -Butyrolactone  
 96-49-1, Ethylene carbonate 105-37-3, Ethyl propionate 105-58-8,  
 Diethyl carbonate 108-32-7, Propylene carbonate 110-71-4  
 115-10-6, Dimethyl ether 512-56-1, Trimethyl phosphate 554-12-1,  
 Methyl propionate 616-38-6, Dimethyl carbonate 623-42-7, Methyl  
 butyrate 1619-62-1, Diethyl dimethyl malonate  
 6065-54-9, Dimethyl dimethyl malonate  
 7550-35-8, Lithium bromide 7791-03-9, Lithium perchlorate  
 10377-51-2, Lithium iodide 14024-11-4, Lithium  
 tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate  
 21324-40-3, Lithium hexafluorophosphate 27132-23-6, Dimethyl  
 diethyl malonate 29935-35-1, Lithium hexafluoroarsenate  
 33454-82-9, Lithium triflate 73506-93-1, Diethoxyethane  
 RL: DEV (Device component use); USES (Uses)  
 (solvent for electrolytic solns. for lithium ion  
 batteries)

OSC.G 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3  
 CITINGS)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 30 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2001:77152 HCAPLUS Full-text

DN 135:291430

TI Organic electrolyte for lithium second cell and lithium second cell

IN Doo, Suk Kwang

PA Samsung Electronics Co., Ltd., S. Korea

SO Repub. Korean Kongkae Taeho Kongbo, No pp. given

CODEN: KRXXA7

DT Patent

LA Korean

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
PI KR 2000002445	A	20000115	KR 1998-23200	

199806

19

PRAI KR 1998-23200 19980619

AB An organic electrolyte for a lithium second cell and a lithium second  
 cell are provided to improve the characteristic of charging and



discharging at a low temperature and a stability at a high temperature The organic electrolyte for a lithium second cell and the lithium second cell are comprised the steps of: putting a reagent bottle containing ethylene carbonate into an elec. mantle and heating at a 70 to 80° to fluidize; adding up LiPF<sub>6</sub> and N-methylcaprolactam into a bottle and shaking to perfectly dissolve; manufacturing the organic electrolyte by adding up dimethylmalonate after putting the fluidized ethylene carbonate.

IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 23  
 ST secondary ~~battery~~ lithium org electrolyte dimethylmalonate  
 methylcaprolactam ethylene carbonate; lithium hexafluorophosphate  
 org electrolyte secondary ~~battery~~  
 IT Secondary ~~batteries~~  
 (organic electrolyte for lithium second cell)  
 IT 96-49-1, Ethylene carbonate 108-59-8, dimethylmalonate  
 2556-73-2, N-Methylcaprolactam 21324-40-3, Lithium  
 hexafluorophosphate  
 RL: NUU (Other use, unclassified); PEP (Physical, engineering or  
 chemical process); PROC (Process); USES (Uses)  
 (organic electrolyte for lithium second cell containing)  
 OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1  
 CITINGS)

L97 ANSWER 31 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 2000:817497 HCAPLUS Full-text

DN 134:6950

TI Electrolytes, liquid crystalline compositions, liquid crystalline  
 compounds, liquid crystalline mixtures, ~~batteries~~, and  
 photovoltaic cells

IN Ono, Michio

PA Fuji Photo Film Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 41 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 2000319260	A	20001121	JP 2000-53711	200002 29
	EP 1033731	A2	20000906	EP 2000-103822	200002 23

EP 1033731	A3	20040225	
EP 1033731	B1	20060705	
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL			
AT 332567	T	20060715	AT 2000-103822
			200002 23
US 6495067	B1	20021217	US 2000-516628
			200003 01

PRAI JP 1999-53162 A 19990301  
JP 1999-55636 A 19990303

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT  
OS MARPAT 134:6950  
GI

\* STRUCTURE DIAGRAM TOO LARGE FOR DISPLAY - AVAILABLE VIA OFFLINE PRINT \*

AB Claimed electrolytes comprise liquid crystalline compds. I [R111 is (substituted) alkyl, alkenyl; Z111 forms 5- or 6-membered aromatic ring cation with N; R121 is a substituent containing  $\geq 1$  ring and alkyl or alkenyl to give liquid crystalline property; X111- is an anion]. Claimed liquid crystalline compns. comprise pyridinium compds. II or imidazolium compds. III (R341, R351, R361, and R371 are H or substituents; R311 and R331 are alkyl or alkenyl; Y311 is 4- or 7-membered divalent ring; Q311 and Q321 are divalent group; n = 1-3). Claimed liquid crystalline compds. are represented as IV or V (Q111 is a divalent group; R141, R151, R161, R171 are H or substituent; R131 is alkyl or alkenyl; Y111 is divalent 4, 5, 6, 7-membered substituent; Q121 and Q131 are divalent group). Mixts. containing  $\geq 2$  IV and/or V are also claimed. Claimed electrolytes may comprise the above compds. Claimed **batteries** comprise the above electrolytes. The photovoltaic cells comprise charge-transfer layers containing the electrolytes and semiconductors responding to radiant rays. The semiconductors may be sensitized with dyes. The electrolytes provide good charge transportation and low volatilization and resulting solar cells have high conversion efficiency and durability.

IC ICM C07D213-56  
ICS C07D213-30; C07D213-68; C07D233-60; C09K019-34; G02F001-13;  
H01L031-04; H01M010-40; H01M014-00  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
Section cross-reference(s): 74  
ST liq crystal electrolyte solar cell; pyridinium iodide liq cryst  
compd electrolyte **battery**; imidazolium iodide liq cryst

compd electrolyte battery  
 IT Battery electrolytes  
 Electrolytes  
 Liquid crystals  
 Photoelectric devices  
 Primary batteries  
 Solar cells  
 (electrolytes containing liquid crystalline comps. for solar cells)  
 IT 75-03-6, Ethyl iodide 107-08-4, Propyl iodide 108-59-8  
 , Dimethyl malonate 112-29-8, 1-Bromodecane  
 872-85-5, 4-Pyridinecarboxaldehyde 10041-02-8 19367-38-5  
 62999-96-6 104539-21-1 134141-55-2  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of; in preparation of liquid crystalline electrolytes for solar cells)  
 OSC.G 7 THERE ARE 7 CAPLUS RECORDS THAT CITE THIS RECORD (8 CITINGS)

L97 ANSWER 32 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1999:325545 HCAPLUS Full-text  
 DN 130:340629  
 TI Organic electrolyte solutions and secondary lithium batteries using the solutions  
 IN Lee, Doo-Yon; Joo, Suk-Kwang; Sohn, Young-Soo; Chung, Bok-Hwan  
 PA Samsung Electronics Co., Ltd., S. Korea  
 SO Jpn. Kokai Tokkyo Koho, 10 pp.  
 CODEN: JKXXAF

DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
PI	JP 11135148	A	19990521	JP 1998-251341	199809 04
	US 6117596	A	20000912	US 1998-148507	199809 04

PRAI KR 1997-45813 A 19970904  
 KR 1998-35848 A 19980901

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OS MARPAT 130:340629

AB The electrolyte solns. have a Li salt dissolved in an organic solvent mixture containing solvents having high dielec. constant, solvents

having low viscosity, and  $\text{ROCO}(\text{CH}_2)_x\text{CO}_2\text{R}'$ , where R and R' = linear or cyclic C1-3 alkyl group and x = integer 1-4. The batteries using the electrolyte solns. have Li containing metal oxide or sulfide cathodes and Li, Li alloy, or carbonaceous anodes.

- IC ICM H01M010-40
- CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
- ST lithium battery electrolyte solvent
- IT Battery electrolytes  
(comps. of electrolyte solvent mixts. for secondary lithium batteries)
- IT 554-13-2, Lithium carbonate 10377-52-3, Lithium phosphate 13453-69-5, Lithium borate ( $\text{LiBO}_2$ ) 18282-10-5, Tin dioxide 26134-62-3, Lithium nitride ( $\text{Li}_3\text{N}$ )  
RL: MOA (Modifier or additive use); USES (Uses)  
(additives in electrolyte solns. containing mixed solvents for secondary lithium batteries)
- IT 21324-40-3, Lithium hexafluorophosphate 90076-65-6 132404-42-3 132843-44-8  
RL: DEV (Device component use); USES (Uses)  
(comps. of electrolyte solvent mixts. for secondary lithium batteries)
- IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-53-3, Diethyl malonate 105-58-8, Diethyl carbonate 106-65-0, Dimethyl succinate 108-32-7, Propylene carbonate 108-59-8, Dimethyl malonate 109-99-9, Thf, uses 110-71-4, 1,2-Dimethoxyethane 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 627-93-0, Dimethyl adipate 1119-40-0, Dimethyl glutarate  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(comps. of electrolyte solvent mixts. for secondary lithium batteries)
- OSC.G 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)
- L97 ANSWER 33 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN
- AN 1999:398962 HCAPLUS Full-text
- DN 131:79877
- TI Electrochemical reduction of  $\text{CO}_2$  in the presence of 1,3-butadiene using a hydrogen anode in a nonaqueous medium
- AU Grinberg, V. A.; Koch, T. A.; Mazin, V. M.; Mysov, E. I.; Sterlin, S. R.
- CS A. N. Frumkin Institute of Electrochemistry, Russian Academy of Sciences, Moscow, 117071, Russia
- SO Russian Chemical Bulletin (Translation of Izvestiya Akademii Nauk, Seriya Khimicheskaya) (1999), 48(2), 294-299
- CODEN: RCBUEY; ISSN: 1066-5285
- PB Consultants Bureau

DT Journal  
 LA English  
 AB The possibility of anodic generation of a solvated proton on a gas-diffusion electrode in an aprotic medium in the presence of carbon dioxide and 1,3-butadiene was demonstrated. Formic acid is the only product of the reaction in the initially aprotic medium using a hydrogen gas-diffusion anode. The influence of the counterion on the reactivity of the CO<sub>2</sub>-radical anion in electrocarboxylation was shown exptl.

CC 72-2 (Electrochemistry)  
 Section cross-reference(s): 22, 23

IT 105-34-0, Methyl cyanoacetate 553-90-2, Dimethyl oxalate  
 RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)  
 (formation in electrocarboxylation of butadiene in acetonitrile)

IT 107-31-3, Methyl formate  
 RL: FMU (Formation, unclassified); PRP (Properties); FORM (Formation, nonpreparative)  
 (formation of trace Me formate in diaphragmless cell with for electrochem. reduction of CO<sub>2</sub> in presence of butadiene using hydrogen anode in a nonaq. medium)

IT 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses  
 RL: DEV (Device component use); PRP (Properties); USES (Uses)  
 (hydrogen gas-diffusion anode with platinum with and without palladium in cell for electrochem. reduction of CO<sub>2</sub> in presence of butadiene)

RE.CNT 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 34 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1998:464361 HCAPLUS Full-text  
 DN 129:109417  
 OREF 129:22483a,22486a  
 TI Salts of malononitrile-based anions for use as ionic conductors  
 IN Armand, Michel; Choquette, Yves; Gauthier, Michel; Michot, Christophe  
 PA Centre National de la Recherche Scientifique (CNRS), Fr.; Hydro-Quebec  
 SO Eur. Pat. Appl., 49 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA French  
 FAN.CNT 5

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	EP 850921	A1	19980701	EP 1997-403189	

				199712 30
EP 850921	B1	20020925		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
CA 2194127	A1	19980630	CA 1996-2194127	
				199612 30
CA 2199231	A1	19980905	CA 1997-2199231	
				199703 05
CA 2244979	A1	19980709	CA 1997-2244979	
				199712 30
CA 2244979	C	20080506		
CA 2248242	A1	19980709	CA 1997-2248242	
				199712 30
CA 2248244	A1	19980709	CA 1997-2248244	
				199712 30
CA 2248246	A1	19980709	CA 1997-2248246	
				199712 30
CA 2248303	A1	19980709	CA 1997-2248303	
				199712 30
CA 2248304	A1	19980709	CA 1997-2248304	
				199712 30
CA 2248304	C	20071113		
WO 9829358	A2	19980709	WO 1997-CA1008	
				199712 30
WO 9829358	A3	19981008		
W: CA, JP, US				
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
WO 9829399	A1	19980709	WO 1997-CA1009	
				199712 30
W: CA, JP, US				
WO 9829389	A1	19980709	WO 1997-CA1010	
				199712 30
W: CA, JP, US				
WO 9829396	A1	19980709	WO 1997-CA1011	

					199712 30
W: CA, JP, US					
WO 9829877	A1	19980709	WO 1997-CA1012		199712 30
W: CA, JP, US					
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE					
WO 9829388	A1	19980709	WO 1997-CA1013		199712 30
W: CA, JP, US					
EP 889863	A2	19990113	EP 1997-951051		199712 30
EP 889863	B1	20030507			
R: DE, FR, GB, IT					
EP 890176	A1	19990113	EP 1997-951052		199712 30
EP 890176	B1	20010620			
R: DE, FR, GB, IT					
JP 2000508114	T	20000627	JP 1998-529517		199712 30
JP 2000508346	T	20000704	JP 1998-529516		199712 30
JP 2000508676	T	20000711	JP 1998-529514		199712 30
JP 4124487	B2	20080723			
JP 2000508677	T	20000711	JP 1998-529515		199712 30
JP 2000508678	T	20000711	JP 1998-529518		199712 30
EP 1201650	A2	20020502	EP 2001-129670		199712 30
EP 1201650	A3	20040102			
EP 1201650	B1	20061122			
R: DE, FR, GB, IT					
JP 2002514245	T	20020514	JP 1998-529513		199712

				30
JP 4070244	B2	20080402		
US 6120696	A	20000919	US 1998-125792	19980828
US 6171522	B1	20010109	US 1998-101811	19981119
US 6333425	B1	20011225	US 1998-101810	19981119
US 6228942	B1	20010508	US 1998-125798	19981202
US 6395367	B1	20020528	US 1998-125799	19981202
US 6319428	B1	20011120	US 1998-125797	19981203
US 6365068	B1	20020402	US 2000-609362	20000630
US 6576159	B1	20030610	US 2000-638793	20000809
US 20010024749	A1	20010927	US 2001-826941	20010406
US 6506517	B2	20030114		
US 20020009650	A1	20020124	US 2001-858439	20010516
US 20020102380	A1	20020801	US 2002-107742	20020327
US 6835495	B2	20041228		
US 20030052310	A1	20030320	US 2002-253035	20020924
US 20030066988	A1	20030410	US 2002-253970	20020924
US 20050074668	A1	20050407	US 2004-789453	20040227
US 20050123831	A1	20050609	US 2004-926283	



				200408 25
JP	2008007781	A	20080117	JP 2007-193021
				200707 25
JP	2009004374	A	20090108	JP 2008-143090
				200805 30
JP	2009149656	A	20090709	JP 2009-10733
				200901 21

PRAI CA 1996-2194127 A 19961230  
 CA 1997-2199231 A 19970305  
 EP 1997-403189 A3 19971230  
 JP 1998-529513 A3 19971230  
 JP 1998-529516 A3 19971230  
 JP 1998-529517 A3 19971230  
 WO 1997-CA1008 W 19971230  
 WO 1997-CA1009 W 19971230  
 WO 1997-CA1010 W 19971230  
 WO 1997-CA1011 W 19971230  
 WO 1997-CA1012 W 19971230  
 WO 1997-CA1013 W 19971230  
 US 1998-101810 A3 19981119  
 US 1998-101811 A3 19981119  
 US 1998-125798 A3 19981202  
 US 1998-125799 A3 19981202  
 US 1998-125797 A1 19981203  
 US 2000-638793 A1 20000809  
 US 2001-858439 A1 20010516  
 US 2002-107742 A1 20020327

ASSIGNMENT HISTORY FOR US PATENT AVAILABLE IN LSUS DISPLAY FORMAT

OS MARPAT 129:109417

AB The title compds., of specified structure and also useful as polymerization catalysts, colorants, etc., are prepared Stirring 10 mmol each stearyl chloride and malononitrile K salt in THF at room temperature for 24 h, filtering, and stirring the filtrate with 500 mg Li2CO3 for 24 h gave >97% C17H35COC(CN)2- Li+. Use of the products in the above applications is exemplified.

IC ICM C07C317-44

ICS C07C255-17; C07C255-65; C07C255-27; C07C255-05; C07C255-35; C08F220-44; C07C255-31; C08G065-48; C08G073-06; C08G077-44; C08G073-02; C07F017-02; C07F007-18; C07C311-02; C09K003-00; H01M006-16; H01M010-40; C07B041-00; C08F004-00

CC 35-3 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 23, 40, 67

IT Battery electrolytes

(malononitrile derivative salts as **battery** electrolytes)  
 IT 67-42-5 81-88-9, Rhodamine B 112-76-5, Stearoyl chloride  
 401-99-0, 1,3-Dinitro-5-(trifluoromethyl)benzene 553-90-2  
 , Dimethyl oxalate 700-16-3, Pentafluoropyridine 38870-89-2,  
 Methoxyacetyl chloride 40724-67-2 53188-07-1, Trolox  
 56512-49-3 86688-96-2, 1H-Pyrrole-3-acetic acid 210043-94-0  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with malononitrile K salt)  
 OSC.G 9 THERE ARE 9 CAPLUS RECORDS THAT CITE THIS RECORD (9  
 CITINGS)  
 RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L97 ANSWER 35 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 1997:505252 HCAPLUS Full-text

DN 127:193073

OREF 127:37405a,37408a

TI Secondary nonaqueous electrolyte **batteries** with oxalate  
 ester containing electrolyte solvents

IN Yamahira, Takayuki

PA Sony Corp., Japan

SO Jpn. Kokai Tokkyo Koho, 7 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI JP 09199172

A

19970731

JP 1996-26160

199601

18

PRAI JP 1996-26160 19960118

AB The **batteries** use Li containing oxide cathodes, Li intercalating  
 carbonaceous anode, and a Li salt electrolyte dissolved in a nonaq.  
 solvent; where the solvent contains diesters of oxalic acid. The  
 esters are selected from di-Me oxalate, di-ET oxalate, di-Pr oxalate,  
 di-iso-Pr oxalate, Et Me oxalate, Me Pr oxalate, and Et Pr oxalate.  
 These **batteries** have high voltage and good cycling performance at  
 heavy loads.

IC ICM H01M010-40

ICS H01M004-58

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery** electrolyte oxalic acid diester

IT **Battery** electrolytes

(solvent mixts. containing diesters of oxalic acid for lithium  
 hexafluorophosphate in secondary lithium **batteries**)

IT 95-92-1, Diethyl oxalate 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 553-90-2, Dimethyl oxalate 615-52-1 615-81-6, Di-iso-propyl oxalate 615-98-5, Dipropyl oxalate 21324-40-3, Lithium hexafluorophosphate 26404-21-7, Methyl propyl oxalate 26404-25-1, Ethyl propyl oxalate  
 RL: DEV (Device component use); USES (Uses)  
 (solvent mixts. containing diesters of oxalic acid for lithium hexafluorophosphate in secondary lithium **batteries**)

OSC.G 1 THERE ARE 1 CAPLUS RECORDS THAT CITE THIS RECORD (1 CITINGS)

L97 ANSWER 36 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 1997:101100 HCAPLUS Full-text

DN 126:106586

OREF 126:20539a,20542a

TI Nonaqueous electrolyte **batteries** having reactive additives in electrolytes

IN Jinno, Maruo; Uehara, Mayumi; Sakurai, Atsushi; Nishio, Koji; Saito, Toshihiko

PA Sanyo Denki Kk, Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	-----
PI	JP 08321311	A	19961203	JP 1995-150843	19950524

PRAI JP 1995-150843 19950524

AB In the **batteries** having cathodes, anodes using Li as an active mass, nonaq. electrolytes obtained by dissolving LiCF<sub>3</sub>SO<sub>3</sub> or LiPF<sub>6</sub> in solvents of ethylene carbonate, propylene carbonate, and/or butylene carbonate having high dielec. constant, and separators, the electrolytes contain 1-20 volume% additives of acetone, MeOH, EtOH, 1-propanol, ethylene glycol, 1,2-propanediol, HAc, propionaldehyde, butylaldehyde, Et Me ketone, 2-pentanone, cyclohexanone, Me formate, Et formate, Pr formate, Me acetate, Et acetate, di-Me oxalate, di-Et oxalate, formic acid, AcOH, propionic acid, acetic anhydride, dimethylethoxysilane, dimethoxydimethylsilane, methyltrimethoxysilane, and/or tetramethoxysilane. The electrolytes may contain 1,2-dimethoxyethane. Since the additives react with Li in anodes and the solvents and the solutes in the electrolytes to form coatings on the anodes for prevention of the reaction between

the electrolytes and the anodes, the **batteries** have improved storage property.

IC ICM H01M006-16  
ICS H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST nonaq **battery** electrolyte reactive additive storage;  
lithium anode nonaq **battery** electrolyte additive

IT **Battery** electrolytes  
(nonaq. **batteries** having reactive additives in electrolytes for storage)

IT 7439-93-2, Lithium, uses  
RL: DEV (Device component use); USES (Uses)  
(anode active mass; nonaq. **batteries** having reactive additives in electrolytes for storage)

IT 57-55-6, 1,2-Propanediol, uses 64-17-5, Ethanol, uses 64-18-6, Formic acid, uses 64-19-7, Acetic acid, uses 67-56-1, Methanol, uses 67-64-1, Acetone, uses 71-23-8, 1-Propanol, uses 75-07-0, Acetaldehyde, uses 78-93-3, Ethyl methyl ketone, uses 79-09-4, Propionic acid, uses 79-20-9, Methyl acetate 95-92-1, Diethyl oxalate 107-21-1, Ethylene glycol, uses 107-31-3, Methyl formate 107-87-9, 2-Pentanone 108-24-7, Acetic anhydride 108-94-1, Cyclohexanone, uses 109-94-4, Ethyl formate 110-74-7, Propyl formate 123-38-6, Propionaldehyde, uses 123-72-8, Butylaldehyde 141-78-6, Ethyl acetate, uses 553-90-2, Dimethyl oxalate 681-84-5, Tetramethoxysilane 1112-39-6, Dimethoxydimethylsilane 1185-55-3, Methyltrimethoxysilane 14857-34-2, Dimethylethoxysilane  
RL: DEV (Device component use); MOA (Modifier or additive use); USES (Uses)  
(electrolyte additive; nonaq. **batteries** having reactive additives in electrolytes for storage)

IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 110-71-4, 1,2-Dimethoxyethane 4437-85-8, Butylene carbonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solvent; nonaq. **batteries** having reactive additives in electrolytes for storage)

IT 21324-40-3, Lithium hexafluorophosphate 33454-82-9, Lithium trifluoromethanesulfonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte; nonaq. **batteries** having reactive additives in electrolytes for storage)

OSC.G 5 THERE ARE 5 CAPLUS RECORDS THAT CITE THIS RECORD (5 CITINGS)

L97 ANSWER 37 OF 41 HCAPLUS COPYRIGHT 2009 ACS ON STN  
AN 1996:387903 HCAPLUS Full-text  
DN 125:38110

OREF 125:7305a,7308a

TI Secondary nonaqueous electrolyte **batteries** with improved electrolyte solvents

IN Matsui, Tooru; Takeyama, Kenichi

PA Matsushita Electric Ind Co Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 08096849	A	19960412	JP 1994-228378	19940922

PRAI JP 1994-228378 19940922

AB Secondary alkali metal **batteries** use nonaq. electrolyte solvent mixts. containing esters of saturated dicarboxylic acid ( $\text{C}_m\text{H}_{2m+1}\text{OCO}(\text{CH}_2)_l\text{CO}_2\text{C}_n\text{H}_{2n+1}$  ( $l \geq 0$ ;  $m \geq 0$ ;  $n \geq 0$ ). The main solvent component is selected from ethylene carbonate, propylene carbonate, and  $(\text{EtO})_2\text{CO}$ .

IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST lithium **battery** electrolyte solvent dicarboxylate esterIT **Battery** electrolytes

(electrolyte solvent mixts. containing saturated dicarboxylate esters for

secondary Li **battery**)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 105-99-7, Dibutyl adipate 106-19-4, Dipropyl adipate 106-65-0, Dimethyl succinate 106-79-6, Dimethyl sebacate 108-32-7, Propylene carbonate 108-59-8, Dimethyl malonate 141-28-6, Diethyl adipate 553-90-2, Dimethyl oxalate 627-93-0, Dimethyl adipate 1119-40-0, Dimethyl glutarate 1732-08-7, Dimethyl pimelate 1732-09-8, Dimethyl suberate 1732-10-1, Dimethyl azelate 14027-78-2, Dipentyl adipate

RL: DEV (Device component use); USES (Uses)

(electrolyte solvent mixts. containing saturated dicarboxylate esters for

secondary Li **battery**)

OSC.G 3 THERE ARE 3 CAPLUS RECORDS THAT CITE THIS RECORD (3 CITINGS)

L97 ANSWER 38 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 1995:905694 HCAPLUS Full-text

DN 123:345711  
 OREF 123:61929a,61932a  
 TI Electrolyte solutions for electrochemical **batteries** and **batteries**  
 IN Nakanaga, Takefumi; Inubushi, Akyoshi; Tani, Masato  
 PA Otsuka Kagaku Kk, Japan  
 SO Jpn. Kokai Tokkyo Koho, 4 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	----	-----	-----	
PI	JP 07211350	A	19950811	JP 1994-19978	19940119
	JP 3418446	B2	20030623		
PRAI	JP 1994-19978		19940119		
AB	The electrolyte solns. comprise as main components or additives dialkyl (C = 1-16) pyrocarbonates and/or dialkyl (C = 1-16) oxalates. The electrolyte solns. may comprise propylene carbonate, ethylene carbonate, di-Et carbonate, dimethoxyethane, THF, 2-methyltetrahydrofuran, and/or dioxolane. <b>Batteries</b> containing the solns. are also claimed. Resulting <b>batteries</b> have high charge-discharge efficiency.				
IC	ICM H01M010-40				
CC	52-2 (Electrochemical, Radiational, and Thermal Energy Technology)				
ST	electrolyte alkyl pyrocarbonate oxalate <b>battery</b>				
IT	<b>Battery</b> electrolytes (electrolyte solns. containing dialkyl pyrocarbonates and/or dialkyl oxalates for <b>batteries</b> for charge-discharge efficiency)				
IT	96-47-9, 2-Methyltetrahydrofuran 96-49-1, Ethylene carbonate 105-58-8 108-32-7, Propylene carbonate 109-99-9, uses 110-71-4 553-90-2, Dimethyl oxalate 615-52-1 615-98-5, Dipropyl oxalate 646-06-0, Dioxolane 1609-47-8, Diethyl pyrocarbonate 4525-33-1, Dimethyl pyrocarbonate 61986-90-1 171250-90-1 171250-91-2 171250-92-3 171250-93-4 171250-94-5				
RL:	DEV (Device component use); USES (Uses) (electrolyte solns. containing dialkyl pyrocarbonates and/or dialkyl oxalates for <b>batteries</b> for charge-discharge efficiency)				
OSC.G	2 THERE ARE 2 CAPLUS RECORDS THAT CITE THIS RECORD (2 CITINGS)				

AN 1995:915783 HCAPLUS Full-text  
 DN 124:145123  
 OREF 124:26985a,26988a  
 TI Mn(III)-mediated in-cell **electrochemical**  
 addition of active methylene compounds to olefins: synthetic and  
 mechanistic aspects  
 AU Nedelec, Jean-Yves; Lachaise, Isabelle; Nohair, Khaddouj; Paugam,  
 Jean Paul; Hakiki, Marjoub  
 CS Laboratoire d'electrochimie, catalyse et syntese organique, CNRS,  
 Thiais, 94320, Fr.  
 SO Bulletin de la Societe Chimique de France (1995), 132(8), 843-9  
 CODEN: BSCFAS; ISSN: 0037-8968  
 PB Elsevier  
 DT Journal  
 LA English  
 OS CASREACT 124:145123  
 AB The Mn-mediated in-cell **electrochem.** addition of active methylene  
 compds. is an interesting alternative to usual chemical methods  
 notably with respect to the amount of manganese salt used. The  
 electrochem. approach however requires the reagent to be readily  
 oxidized in order to be associated with an efficient in situ anodic  
 regeneration process. We have used amperometric measurements to show  
 that the rate consts. for the Mn(III)-oxidation of active methylene  
 compds. at 60°C range between 10<sup>-2</sup> and 1.2 L mol<sup>-1</sup>s<sup>-1</sup>. In this study  
 we show that the addition reaction occurs in the coordination sphere  
 of Mn; this requires the active methylene compound and the olefin to  
 be coordinated to the Mn salt. This aspect can be critical in the  
 electrochem. process insofar as the catalytic manganese salt can  
 sometimes be fully coordinated by only one reagent, either the active  
 methylene compound (eg, 2,4-pentanedione) or the olefin (eg,  
 styrene).  
 CC 22-7 (Physical Organic Chemistry)  
 Section cross-reference(s): 21, 72  
 IT Methylene group  
 (active methylene compds.; synthetic and mechanistic aspects of  
 Mn(III)-mediated in-cell **electrochem.** addition  
 of active methylene compds. to olefins)  
 IT Addition reaction catalysts  
 Kinetics of addition reaction  
 (electrochem.; synthetic and mechanistic aspects of  
 Mn(III)-mediated in-cell **electrochem.** addition  
 of active methylene compds. to olefins)  
 IT Radicals, reactions  
 RL: FMU (Formation, unclassified); PEP (Physical, engineering or  
 chemical process); RCT (Reactant); FORM (Formation, nonpreparative);  
 PROC (Process); RACT (Reactant or reagent)  
 (mechanistic reaction intermediates; synthetic and mechanistic

- aspects of Mn(III)-mediated in-cell electrochem  
 . addition of active methylene compds. to olefins)
- IT Amperometry  
 Oxidation, electrochemical  
 (synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem. addition of active methylene compds. to olefins)
- IT Acids, reactions  
 RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (carbon, active methylene compds.; synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem  
 . addition of active methylene compds. to olefins)
- IT Coordination  
 (chelation, synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem. addition of active methylene compds. to olefins)
- IT Addition reaction  
 Kinetics of oxidation  
 Oxidation catalysts  
 (electrochem., synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem. addition of active methylene compds. to olefins)
- IT 2114-29-6P 173197-93-8P  
 RL: BYP (Byproduct); PREP (Preparation)  
 (synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem. addition of active methylene compds. to olefins)
- IT 638-38-0, Manganous acetate 14546-48-6, reactions  
 RL: CAT (Catalyst use); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)  
 (synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem. addition of active methylene compds. to olefins)
- IT 100-42-5, Styrene, reactions 105-34-0, Methyl cyanoacetate 108-59-8, Dimethyl malonate 110-83-8, Cyclohexene, reactions 111-78-4, 1,5-Cyclooctadiene 123-54-6, 2,4-Pentanedione, reactions 126-81-8, Dimeone 141-82-2, Malonic acid, reactions 372-09-8, Cyanoacetic acid 592-76-7, 1-Heptene 2033-24-1, Meldrum's acid 13361-53-0, Hexyl cyanoacetate 14064-10-9, Diethyl chloromalonate  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem. addition of active methylene



compds. to olefins)  
 IT 5789-31-1P 13463-61-1P 17216-65-8P 33574-07-1P 49769-76-8P  
 80627-89-0P 92912-81-7P 98995-98-3P 130092-05-6P  
 136933-87-4P 173197-94-9P 173197-95-0P 173197-96-1P  
 173197-97-2P 173197-98-3P 174629-88-0P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (synthetic and mechanistic aspects of Mn(III)-mediated in-cell electrochem. addition of active methylene compds. to olefins)

OSC.G 6 THERE ARE 6 CAPLUS RECORDS THAT CITE THIS RECORD (6 CITINGS)

L97 ANSWER 40 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 1990:59766 HCAPLUS Full-text

DN 112:59766

OREF 112:10215a,10218a

TI Manufacture of lithium **batteries** with manganese dioxide cathodes

IN Kita, Fusaji; Kajita, Kozo

PA Hitachi Maxell, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	JP 01265454	A	19891023	JP 1988-94730	19880418

PRAI JP 1988-94730 19880418

OS MARPAT 112:59766

AB In the manufacture of Li-MnO<sub>2</sub> **batteries**, the MnO<sub>2</sub> is treated with esters R<sub>1</sub>CO<sub>2</sub>R<sub>2</sub> (R<sub>1</sub> = H, C<sub>1</sub>-4-alkyl; R<sub>2</sub> = C<sub>1</sub>-5-alkyl) or R<sub>3</sub>OCOCOR<sub>4</sub> (R<sub>3</sub>, R<sub>4</sub> = C<sub>1</sub>-4-alkyl) after drying. This treatment suppresses the reaction of MnO<sub>2</sub> with propylene carbonate in the electrolyte and increases the shelf life of the **batteries**. Thus, dried MnO<sub>2</sub>-graphite-PTFE cathodes were immersed in EtOAc for 72 h and rinsed with MeOCH<sub>2</sub>CH<sub>2</sub>OMe, and dried for use in Li **batteries**. Battery capacity was not affected by the treatment.

IC ICM H01M004-50

ICS H01M004-08

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST **battery** cathode manganese dioxide pretreatment; ester treatment manganese dioxide cathode; ethyl acetate treatment manganese cathode

IT Cathodes  
 (battery, manganese dioxide, treatment of, with esters,  
 for storage stability)

IT 95-92-1, Diethyl oxalate 123-86-4, Butyl  
 acetate 141-78-6, Ethyl acetate, uses and miscellaneous  
 RL: USES (Uses)  
 (cathodes from manganese dioxide treatment with, for lithium  
 batteries)

IT 1313-13-9, Manganese dioxide, uses and miscellaneous  
 RL: USES (Uses)  
 (cathodes, ester treatment of, for lithium batteries)

IT 108-32-7, Propylene carbonate  
 RL: USES (Uses)  
 (electrolyte solvent, prevention of reaction of manganese dioxide  
 with, in lithium batteries)

L97 ANSWER 41 OF 41 HCAPLUS COPYRIGHT 2009 ACS on STN

AN 1985:69341 HCAPLUS Full-text

DN 102:69341

OREF 102:10781a

TI Electrochemical dicarboxylation of unsaturated organic compounds

IN Tkatchenko, Igor Boris Michel; Ballivet-Tkatchenko, Danielle A.;

Murr, Nabil El; Tanji, Jamal; Payne, John David

PA Societe Nationale des Poudres et Explosifs, Fr.

SO Fr. Demande, 14 pp.

CODEN: FRXXBL

DT Patent

LA French

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI	FR 2542764	A1	19840921	FR 1983-4355	198303 17
	FR 2542764	B1	19850621		
PRAI	FR 1983-4355		19830317		
AB	A procedure is described for preparing dicarboxylic acids or their derivs. directly from unsatd. organic compds. The latter are electrochem. reduced in a cell in the presence of CO <sub>2</sub> , a catalyst comprising a transition metal carbonyl complex, and a supporting electrolyte and/or a nonaq. solvent usable in the electrochem. of unsatd. compds. and an electrolyte at a slightly electroneg. potential, lower than the electroredn. potential of CO <sub>2</sub> and of the unsatd. compound at 0-50 bars pressure and a temperature of -20 to 60°. Then the reaction is conducted in a known manner of the dicarboxylate anion formed to obtain the acids or their derivs. The				

obtained compds. are intermediates in very interesting syntheses, e.g. of polymers. An example is given of the preparation of the methyl-3-hexene-1,6-dicarboxylate [41820-27-3] from butadiene. Into an electrochem. cell, under Ar, one places successively Hg, a bar magnet, the complex di-Fe dicyclopentadienyl tetracarbonyl (50 mg,  $0.15 \times 10^{-3}$  mol) and then the solvent THF (80 mL) containing the electrolyte Bu<sub>4</sub>NPF<sub>6</sub> (15 g, 0.038 mol). To the solution is added butadiene (6 g, 0.11 mol) dissolved in 20 mL of THF at 0°. The solution is then placed in the anodic compartment. After closing the reactor, CO<sub>2</sub> is introduced to obtain and maintain a pressure of 3 bars at room temperature in the reactor during the electrolysis which consumes CO<sub>2</sub>. The electrolysis is stopped after .apprx.10 h (3560 coulombs were consumed). After degassing the cell, the reaction mixture is distilled under static vacuum (10-1 torr) at ambient temperature to remove the solvent and excess reactants. The current efficiency is 76%.

IC C25B003-04; B01J031-20; C07C069-34; C07C069-593; C07C069-612

CC 72-4 (Electrochemistry)

Section cross-reference(s): 23

IT 553-90-2

RL: PRP (Properties)

(electrochem.preparation of, from ethylene in presence of carbon dioxide)

OSC.G 4 THERE ARE 4 CAPLUS RECORDS THAT CITE THIS RECORD (4 CITINGS)

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

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